

MOTOR AGE

Maxwell Team Wins Glidden Trophy

Fourteen Cars Reach Jacksonville with Perfect Scores After 11 Days' Run From New York

JACKSONVILLE, Fla., Oct. 26—The Maxwell factory team, entered as representing Tarrytown, N. Y., won the Glidden trophy, scoring perfect for all three cars during the entire 11 days of running from New York to Jacksonville. Two of the cars would have been penalized for the run into Roanoke, Va., but for the ruling of Referee Walker that all cars should be allowed 26 minutes on account of delays resulting from a blockade of the road by two automobile fire-engines that mired down a few miles south of Natural Bridge and held up the Glidden cars for that length of time. Despite this delay one of the cars checked in on time and the others were only 6 minutes late. In case no allowance had been made, the margin by which the Maxwell team won would have been wider because it saved only twelve points while its near rivals saved fifty or more.

There were fourteen cars with clean scores at the end of the tour, namely: Maxwell 1, 2, 3 and 4, Stevens-Duryea 11 and 39, Cadillacs 32, 40 and 48, Fords 44 and 45, Flanders 54, Columbia 49 and Mitchell 19. These cars drew for the Anderson trophy, a huge silver punch-bowl, and the choice fell upon Maxwell 4, the entry of Governor Hoke Smith of Georgia.

The divisional prizes offered in each of the seven sections of Class A, consisting of \$200 in each class, were won by the following. Where more than one car is named the prize was divided: Division 1, Fords 44 and 45 and Flanders 54; division 2, Mitchell 26; di-

RESULTS OF GLIDDEN TOUR

Glidden trophy.....	Maxwells 1, 2, 3
Anderson trophy.....	Maxwell 4
DIVISIONAL PRIZES	
Div. 1.....	Fords 44 and 45, Flanders 54
Div. 2.....	Mitchell 26
Div. 3.....	Maxwells 1, 2, 3 and 4
Div. 4.....	Cadillacs 32, 40 and 48
Div. 5.....	Mitchell 19
Div. 6.....	Stevens 11, 39 and Columbia 49
Div. 7.....	American 5

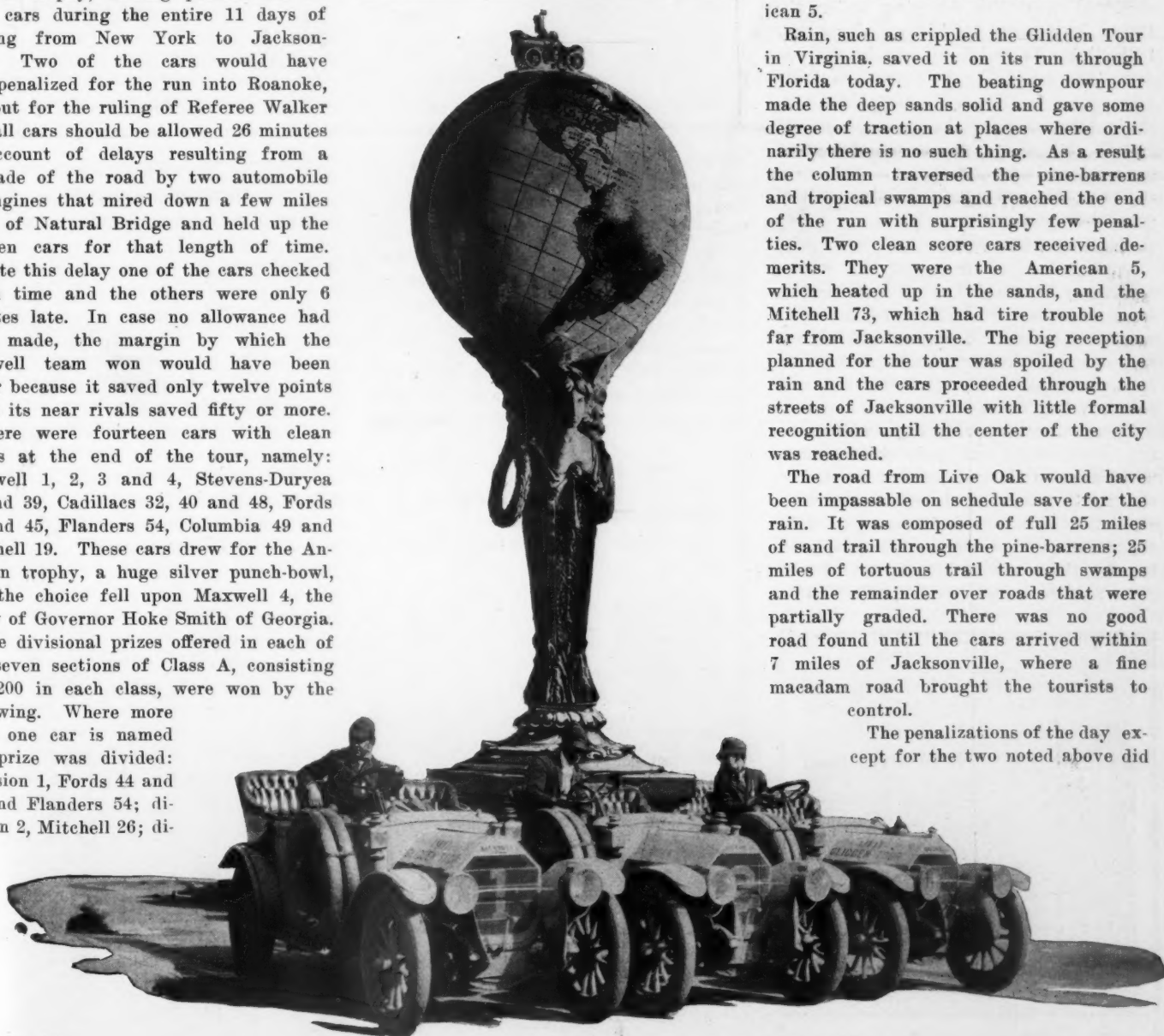
Stevens-Duryea Team a Close Second for Prize—Forty-Seven Contestants Finish Trip

vision 3, Maxwells 1, 2, 3 and 4; division 4, Cadillacs 32, 40 and 48; division 5, Mitchell 19; division 6, Stevens-Duryeas 11 and 39 and Columbia 49; division 7, American 5.

Rain, such as crippled the Glidden Tour in Virginia, saved it on its run through Florida today. The beating downpour made the deep sands solid and gave some degree of traction at places where ordinarily there is no such thing. As a result the column traversed the pine-barrens and tropical swamps and reached the end of the run with surprisingly few penalties. Two clean score cars received demerits. They were the American 5, which heated up in the sands, and the Mitchell 73, which had tire trouble not far from Jacksonville. The big reception planned for the tour was spoiled by the rain and the cars proceeded through the streets of Jacksonville with little formal recognition until the center of the city was reached.

The road from Live Oak would have been impassable on schedule save for the rain. It was composed of full 25 miles of sand trail through the pine-barrens; 25 miles of tortuous trail through swamps and the remainder over roads that were partially graded. There was no good road found until the cars arrived within 7 miles of Jacksonville, where a fine macadam road brought the tourists to control.

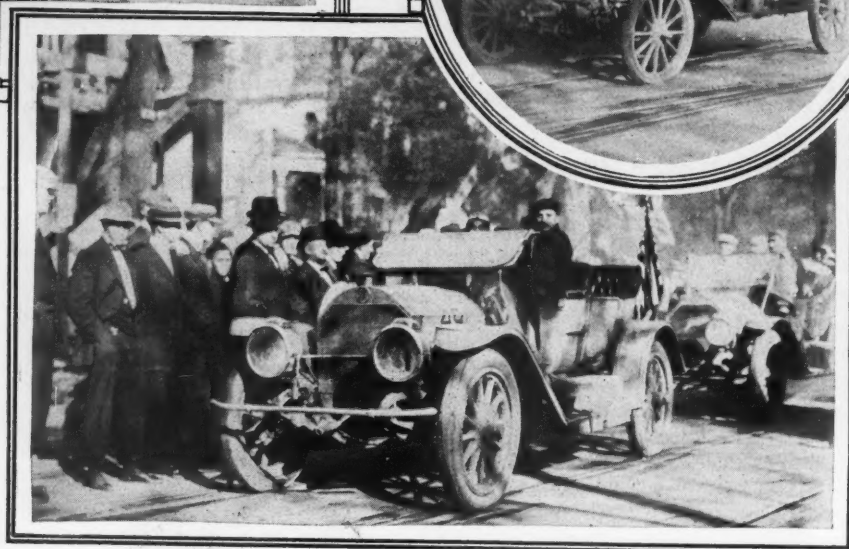
The penalizations of the day except for the two noted above did



THE WINNING MAXWELL TEAM AND THE GLIDDEN TROPHY



THREE OF THE PERFECT-SCORE CARS
Above, 54 Flanders of the Detroit team
At right, 44 Ford checking out at noon
Below, 49 Columbia leaving a control



not affect the standing of teams or individuals.

Dripping with rain, beaten by road and weather conditions almost from the start of the run from New York, the Glidden tour rolled into Jacksonville last Thursday. With spirits drooping under the tragic happening at Tifton, there was little lightness and happiness in the column that made the long trip, covering 1,454 miles in 11 days. Sixty-four typically representative American motorcars started from New York in the contesting division and forty-seven finished with scores good enough to receive official cognizance.

A Surprising Showing

On the face of the event this was a surprising showing, but under the surface there is an excellent reason. The wonder is not that seventeen cars fell out and were penalized at least 1,000 points each, but that forty-seven finished and fourteen had clean scores.

There were 3 running days when road conditions could not have been worse. The run into Gettysburg was hard, but the roads encountered in Pennsylvania were fine highways in comparison with the route on both sides of Roanoke and through the sands of Florida.

As fortune would have it, rain fell in

a deluge upon the tour after leaving Natural Bridge, making the road tractionless where it was not bottomless. This rain extended southward and converted what were supposed to be passable roads leading well up toward the summit of the Blue Ridge, into smeary imitations of toboggan slides. Six unbridged creeks, made swollen and angry by the rain in the hills, added to the problem of the run into Winston-Salem. In Florida the rain was a life-saver, hardening the sands so

INDIVIDUAL SCORES

27	Chalmers	13
*42	E-M-F	2342
26	Mitchell	88
41	Winton	54
52	Packard	14
59	Cadillac	146
70	Krit	45
71	Case	662
*72	Haynes	1728
73	Mitchell	18
*Withdrawn		

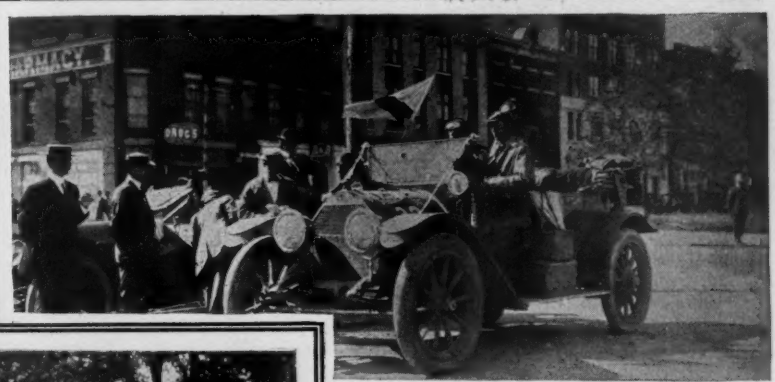
FINAL STANDING OF TEAMS IN GLIDDEN TOUR

Final standing of the teams competing at finish for the Glidden trophy:

	1	2	3	4	5	6	7	8	9	10	11	Car Totals	Team Totals
TARRYTOWN													
1 Maxwell	0	0	0	0	0	0	0	0	0	0	0	0	
2 Maxwell	0	0	0	0	0	0	0	0	0	0	0	0	
3 Maxwell	0	0	0	0	0	0	0	0	0	0	0	0	0
ATLANTA NO. 2													
11 Stevens	0	0	0	0	0	0	0	0	0	0	0	0	
39 Stevens	0	0	0	0	0	0	0	0	0	0	0	0	
66 Stevens	0	0	0	10	9	0	0	0	0	0	0	19	19
JACKSONVILLE													
32 Cadillac	0	0	0	0	0	0	0	0	0	0	0	0	
40 Cadillac	0	0	0	0	0	0	0	0	0	0	0	0	
47 Cadillac	0	0	0	23	0	0	0	0	0	0	0	23	23
ATLANTA NO. 3													
43 Ford	0	0	0	125	0	0	0	0	0	0	0	125	
44 Ford	0	0	0	0	0	0	0	0	0	0	0	0	
45 Ford	0	0	0	0	0	0	0	0	0	0	0	0	125
LIVE OAK													
31 Cadillac	0	0	0	0	189	0	0	0	0	0	0	189	
51 Cadillac	0	0	0	13	0	0	0	0	0	0	0	74	87
74 Cadillac	0	0	3	0	0	0	0	0	0	0	0	3	279
NASHVILLE													
56 Marathon	0	0	0	72	153	0	0	0	0	0	0	225	
57 Marathon	0	0	0	0	210	0	0	0	0	0	31	241	
58 Marathon	0	0	0	9	34	0	0	0	0	0	0	43	509
DETROIT													
53 Flanders	0	591	0	0	0	21	0	0	0	0	0	612	
54 Flanders	0	0	0	0	0	0	0	0	0	0	0	0	
55 Flanders	0	0	0	416	0	0	0	0	0	0	0	416	1028



GLIDDENITES SEE ANCIENT TRAVEL



SOME OF THE CLEAN SLATES
At left, 19 Mitchell at night control
Above, 32 Cadillac of Florida team
Below, 11 Stevens-Duryea on the road

that it was possible for the cars to get through.

The major portion of the demerits imposed came on the fourth day or later. Many of the drivers were southerners and most of them owned their own cars. The problem presented to them by the roads in Virginia was so complex that many of them took penalties rather than try to get in on time. There is no question as to their nerve and skill, they had both, but the roads were too dangerous.

The winning cars were scientifically handled throughout. Deadly speed when unnecessary to make controls was not resorted to. There was no effort to check the team in with an hour to spare, simply to get in ahead of others. The three Maxwell drivers, Walls, Gager and Costello, are experts and drove on a definite speed schedule just sufficient to make controls with an allowance for possible tire trouble before checking in.

Cars Scientifically Handled

In the 6 years that Harry Walls has been driving in reliability runs he has made every control without time penalty. Eugene G. Gager, who drove No. 2, is connected with the Pittsburgh agency of the United States Motor Company. He is a wonderful judge of pace and a marvel at nursing his car. Thomas M. Costello,

FINAL SCORES OF OTHER GLIDDEN TOUR CARS

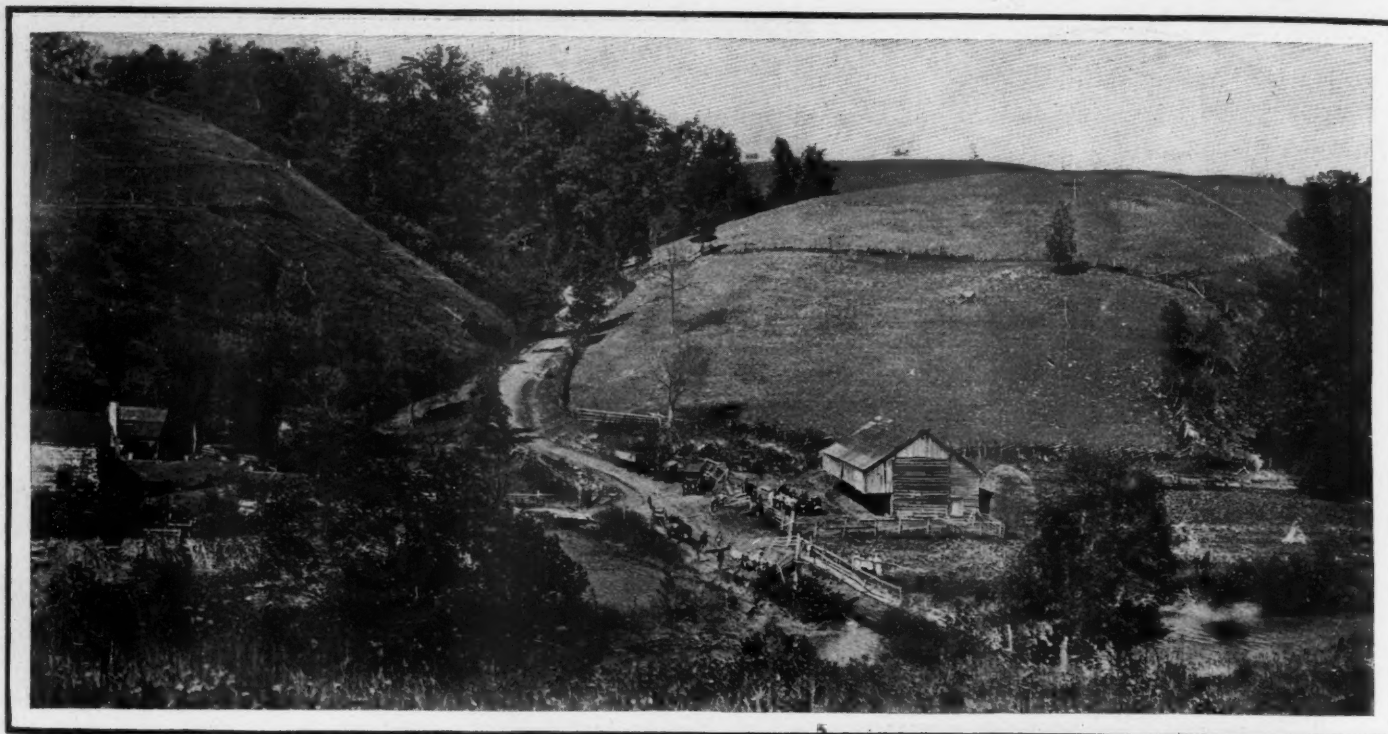
Following teams eliminated by the withdrawal of one car each from the contest:

	1	2	3	4	5	6	7	8	9	10	11	Car Totals	Team Totals
GEORGIA-DIXIE													
4 Maxwell	0	0	0	0	0	0	0	0	0	0	0	0	0
49 Columbia	0	0	0	0	0	0	0	0	0	0	0	0	0
50 Maxwell	0	0	0	1000	0	0	0	0	0	0	0	1000	1000
ATLANTA JOURNAL													
5 American	0	0	0	0	0	0	0	0	0	0	7	7	7
6 Thomas	0	0	0	0	0	1000	0	0	0	0	0	1000	1000
7 White	0	0	0	0	18	0	9	0	0	0	0	27	1034
ATLANTA NO. 4													
10 Pierce	0	0	0	0	12	14	0	0	0	0	14	40	40
12 Marmon	0	0	0	0	0	1000	0	0	0	0	0	1000	1000
64 Pierce	0	0	0	3	105	0	0	1000	0	0	0	1108	2148
EVERGLADES													
33 Cole	0	0	0	87	13	62	0	19	0	0	0	181	181
46 White	0	0	0	4	42	0	0	4	1000	0	0	1050	1050
48 Cadillac	0	0	0	0	0	0	0	0	0	0	0	0	0
CORDELE													
60 Oldsmobile	0	0	0	4	81	26	39	1000	0	0	0	1150	1150
65 Oldsmobile	0	0	0	0	0	0	0	17	0	0	0	17	17
69 Oldsmobile	0	0	0	1	0	0	0	0	0	7	0	8	1175
ALBANY, GA.													
34 Halladay	0	63	0	0	0	0	0	0	0	0	0	63	63
35 Halladay	0	0	0	0	228	0	0	0	0	0	0	228	228
36 Halladay	0	31	0	0	0	1000	0	0	0	0	0	1031	1322
ATLANTA NO. 1													
8 Flanders	0	0	0	0	0	296	0	0	0	0	0	296	296
63 Flanders	0	0	0	0	104	0	0	0	0	1000	0	1104	1104
61 Flanders	0	0	0	5	0	0	0	0	0	0	0	5	1405
WALTHAM, MASS.													
15 Metz	0	0	0	0	130	24	6	0	0	0	0	0	0
16 Metz	0	0	0	0	57	0	328	0	0	0	0	0	0
17 Metz	0	0	0	0	1000	0	0	0	0	0	0	1000	1000
ATLANTA NO. 6													
18 Garford	0	0	0	960	10	0	0	0	0	0	0	970	970
19 Mitchell	0	0	0	0	0	0	0	0	0	0	0	0	0
20 Schacht	0	0	0	0	0	1000	0	0	0	0	0	1000	1970
ATLANTA NO. 7													
21 Corbin	0	0	0	0	23	0	0	0	0	0	0	23	23
14 White	0	0	0	152	981	1000	0	0	0	0	0	2133	2133
22 Thomas	0	0	0	0	0	0	0	0	0	1000	0	1000	3156
FLORIDA													
28 Cadillac	0	4	0	0	0	0	0	0	0	0	0	4	4
29 Cadillac	0	0	0	226	0	0	0	0	0	0	0	226	226
37 Cadillac	0	0	0	0	3	11	0	0	0	0	0	14	14

*Not in †Disqualified



ATLANTA'S SPEED LIMIT



THE SHENANDOAH VALLEY OFFERED GOOD ROADS AND BEAUTIFUL SCENERY

the youthful pilot of Maxwell 3, is best known as a racing driver and winner of numerous important events on track and road. Costello proved himself a wizard at the wheel and possessed of an intuitive knowledge of car saving on rough roads.

Stevens-Duryea Close Second

The Stevens-Duryea team, representing Atlanta, was a close second in the race for the trophy. These big cars, Nos. 11, 39 and 66 received a total of nineteen demerits, all of which were scored against No. 66, entered by Brooks Morgan and driven by Murphy. The car was 36 minutes late in reaching Roanoke, owing to the blockade, and was allowed 26 minutes under the rule, leaving it with ten points for the day. The following day it was 9 minutes late in reaching Wins-



MISS MARKS, THE ONLY WOMAN CONTESTANT IN THE GLIDDEN



THE GLIDDENITES WERE ESCORTED INTO ATLANTA

ton-Salem. The other cars were clean throughout the running.

The same sort of a story may be told of the Jacksonville Cadillac team, which had two clean scores at the finish, and one car, No. 47, penalized 23 minutes for lateness into Roanoke. This car could have made control but for the fact that it carried two women and some caution had to be used in making the run. The result was that the car found the fords deep and dangerous, but finally managed to get in with 49 minutes to the bad. Of these 26 were remitted and the score to the end stood twenty-three demerits.

Similarly reads the story of the Ford team's showing. Car 43 suffered a broken axle out of Roanoke and was demerited 125 points. The others were clean all the way.

The Live Oak Cadillac team was heavily handicapped by the demerits imposed on Capt. W. J. Hillman's car. He waited

for supper at Martinsville and was late in reaching Winston-Salem. The car also suffered clutch trouble at that stage of the tour. Both of the other members received penalties, No. 74 on the run into Gettysburg and No. 51 on the final day.

The Nashville Marathon team was roundly penalized on the fourth and fifth day's running and No. 57 broke spring and axle going into Jacksonville. This team, however, was the only one on the tour to make the whole distance under the power of its own engines. This happened because the three cars were the only ones that forded Back creek without assistance. All the others had one or more



HURRYING INTO CONTROL



TEAMMATES HUNG TOGETHER



TWO VARIETIES OF ROADS IN FLORIDA

cars swamped in the raging torrent of the creek.

The Flanders factory team made a commendable showing most of the trip and one car came through with a clean score. Broken axles caused the others to be penalized, but the three cars finished in clever style.

The Metz team, which had a clean score into Roanoke, was overwhelmed by the run into Winston-Salem in the dark. The exceedingly rough mountain roads and the deep fords proved too much for No. 17, which broke a wheel and retired. On the last day's run the two survivors failed to put in an appearance before the close of control.

The official cars all had a rough trip. The pacemaking Cunningham was wrecked at Tifton; the Pierce-Arrow press car was smashed early in the run in Virginia; the Reo pilots experienced several accidents,

one breaking a wheel and the other dislocating its propellor shaft in a North Carolina ford. The Reo truck made controls in good style and the Velie press car was always on hand. The Chalmers six had no trouble after the first day, when it suffered a burned bearing.

Scenery Alone Worth Trip

The route of the Glidden carried the tourists through as great a variety of country and scenery as could be imagined. Particularly did the Shenandoah valley appeal to the eye. The first stop in the real Dixieland was at Gettysburg. The trip from there carried the motorists through a very beautiful and interesting section of the country, with continued evidences of the prosperity of the people.

In the really mountainous country between Staunton and Roanoke, Va., the scenery was all that could be desired, but the going was rough.



ALONG THE SUANEE RIVER ON GLIDDEN ROUTE



AN OLD BRIDGE NEAR WINSTON-SALEM



MOTOR AGE

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Gasoline—Some Aspects Of It

MOTOR AGE begins in this issue a series of articles, that will appear from week to week, on the subject of gasoline. The necessity of such a series of articles has long been known. It is questionable if there is any other subject in connection with the modern motor car in which so much ignorance exists. Every car, except electrics, has to use gasoline and yet how few owners know anything about it. Car owners have time without end asked for 70 or 76 gravity gasoline and yet did not know what they were asking about. Many, who had a smattering of chemical education, imagined the gravity meant specific gravity, meaning the relation of the weight of the gasoline to the weight of water taken as a standard. They were horrified when told that gravity did not mean specific gravity at all, but in fact meant directly opposite to specific gravity. This but establishes the fact of the great amount of ignorance that exists among car owners on the subject of gasoline.

NEXT to the erroneous ideas on gravity in gasoline comes that of the relative value of different grades of gasoline. The ignorance in this matter has been exhibited time and time again at track and road races. One concern would not use anything but 85 gravity gasoline because they claimed it was quicker and more powerful, hence the car would make better speed. In the same meet another concern would not use anything but 56 gravity gasoline on the ground that it gave more power and was faster. Here were the two opposites. In the races it happened that the car with the 56 beat the car with the 85. As a matter of fact there was more power in the 56, but it took a little longer to get the motor warmed up to its use and in cold weather it was harder to crank up with the 56 than with the 85. The race proved one thing, however, namely, that the 56 had more power in it gallon for gallon than the 85.

THE ignorance of the real nature of gasoline has been exhibited time and time again with dealers in their demonstrating cars. In Chicago one branch manager for years bought nothing but 76 gasoline for his demonstrating cars. He would not use any other. He imagined that it made his cars faster and that they would pick up quicker and get away faster. Well, this branch manager has now changed his mind. He uses 60 gravity gasoline, has not much more difficulty in cranking up and finds that his motor gets away faster with the 60 than it used to with the 76. The improvements in the motor design may be responsible for this; if so, it but proves the fact that gasoline should not be blamed for the shortcomings of the motor.

NOBODY will dispute the fact that it will be a little harder to crank a big motor with 56 gasoline than with 76, but the carburetor makers are wrestling with this problem. They are improving their apparatus every few months. The waterjacketing features have been improved; the starter valve, to reduce the air opening and so put a stronger pull on the gasoline, has been more generally introduced; the hot air pipe from the exhaust manifold to the main air intake has been fitted; dash adjustments, to insure a good rich charge of mixture in the cylinders before stopping, have been installed; and now the self-starters are being heard of on every hand. All of these improvements are going hand in hand with the low-gravity gasoline. One is assisting the other in its work of making the motor economical.

SOME will ask: Why use low-gravity gasoline if it is harder to start with than high-gravity fuel? There are two reasons: First, the low-gravity fuel contains more heat units per gallon and consequently will give more power; second, the low-grade fuel is cheaper. What more could be asked for, more power and cheaper power? These two factors should alone determine which grade of fuel is to be preferred. Motorists would sooner have a little extra work in starting than have the price of fuel go up several cents a gallon and with the higher price not get so much power. The motorists will not have to experience the starting trouble long, because, as intimated, the self-starter movement is here, and if the low-gravity gasoline will help to hasten the self-starter movement it will be doing more good work. Self-starters are needed, they should be on every gasoline car in use today, and should be put on all cars that are being built.

MOTOR AGE readers are invited to submit their experiences with gasoline. This is a vital subject today. It is a subject on which much light is needed. Criticisms, so long as they are just, are always welcomed. Readers should properly sign any communications they may send in to this office. All will be published. There is not any other question that will appeal to more readers, and the best way to get to the bottom of any question is for everyone interested to express what he or she knows on the matter. Those who have had experiences with low-grade fuels are specially invited to submit their experiences. Those who have used low-gravity fuels in cold sections of the country, or during the winter seasons, are solicited for their experiences. The devotees of the high-gravity fuel are invited for their views on the subject. The experiences of racing drivers will aid in the general controversy. The experiences of all will be a part in this great argument.

The New Valve Types

IT IS expected that with the opening of the Olympia show in London early in November the student of valve designs will be in a better position to surmise on the future of slide valves, sleeve valves, rotary valves and other valve types than a year ago. Last season at the London show there was an avalanche of different types of valves, but, as after events proved, many of these different types had never been tried out. They had been designed and built for exhibition purposes and for sale. After the show the majority of them dropped into oblivion and have remained there ever since. This year conditions will be somewhat different. There will not be so many of the fantastic designs but several of those, that will be exhibited, will be designs that have actually been completed and have been in use. In a year there has been enough time to determine whether or not a certain type of valve has sufficient merit to warrant its manufacture. There are several of those, brought out last year, that have since proven sufficiently meritorious to be promoted into the realm of actual manufacture. There will, of course, be exhibited some new untried, promotion-types of valves, but their number will be small; on the other hand, those designs that were exhibited last year and are again shown this year in perfected form must have a moiety of feasibility in them. From such continued and perfected types it will be possible to build up a concept, at least, of what is going to take place in the valve sphere. The test of a year is the biggest eliminator of mental hallucinations, even in the designing field. This year it will be more of a case of getting down to bed rock or down to hard facts. Promoters generally get tired of putting up the money for unpractical ideas.

French Avoid Strenuous Reliability

PARIS, Oct. 20—Twenty-five hundred miles in daily stages of 210 miles, at an average speed of 18½ miles an hour, is the task that is set French manufacturers of light cars taking part in the reliability trials next March. As it is the manufacturers themselves who have decided on the conditions, they evidently do not rate the ability of their cars very high, for it would be a poor one which, in the year 1912, could not travel 2,500 miles at less than 20 miles an hour over well-made and well-graded roads.

The event indeed is more of a selling demonstration than a technical competition, for the route has been selected so as to include such important towns as Nancy, Dijon, Lyons, Grenoble, Nice, Marseilles, Narbonne, Toulouse, Bordeaux, Nantes, Rouen and Amiens, and further, the time of the year is the most favorable for the selling of cars. It is obvious that no driver will consent to remain on the road the necessary 12 hours if traveling at an average of 18½ miles an hour, but this low average has been adopted in order to allow all to get in on schedule time, whatever incidents may develop, and incidentally to give time for visiting agents and interviewing prospective customers.

It was at first proposed that a real competition should be held, something in the nature of a sealed bonnet competition, with gasoline and lubricating oil controlled, a distance of about 250 miles a day and an average speed of only a little less than 30 miles an hour. This would have given substantial grounds for comparison, and would have been an event worth competing in. But the French manufacturers unanimously cried out that if the bonnets were sealed spark plugs would be sure to give trouble, water would find its way to the carbureter, magneto wires would break or become detached; in a word, that all those little annoyances which rarely happen on a well-regulated car, and which are of no significance when they do happen, would be showered down with disastrous results from a commercial standpoint. Thus the real test was tabooed and the easy-going reliability trial put in its place.

It is understood that the drivers can do anything they like to the cars on the road, providing they make the average. In reply to a question, it has been declared that there is no reason why a crankshaft or pistons should not be changed if thought necessary. "If the work can be done in the running time, it will only prove that the car is remarkably accessible and easy to dismount, and there is no reason why we should penalize it for such a quality." Arguing that the man who seeks to prove much ends by proving nothing, the makers have gone to the other extreme and are not going to attempt to prove anything.

Run of 2500 Miles At Easy Pace Planned—Affair Similar to This Year's Glidden

More correctly, they are only going to prove to the provincials that their cars are worth buying, and as a procession of salesmen the event is not without interest.

Among the firms having already promised to take part in the trials are Ford, Gregoire, Delage, Barre, Alcyon and Crespelle.

TO HAVE GOOD ROADS WEEK

Richmond, Va., Oct. 29—Governor Mann has issued a proclamation calling attention to the national good roads congress to be held in Richmond, November 20-23, designating the week immediately preceding it as good roads week. The governors of every state in the Union will be asked to



- November 3-11—England's annual Olympia show.
- *November 4-6—Phoenix road race, Maricopa Automobile Club.
- *November 8—Track meet of Maricopa Automobile Club, Phoenix, Ariz.
- November 9-11—Track meet, San Antonio Automobile Club.
- November 20-24—First American road congress at Richmond, Va., under auspices of American Association for Highway Improvement.
- November 22—Road users' day, American Road Congress, Richmond, Va., under direction of Touring Club of America.
- November 22—Start of 11-day around-Georgia tour.
- *November 27—Vanderbilt road race, Savannah, Ga.
- November 30—Grand Prix race, Savannah, Ga.
- January 6-13—Twelfth annual show, pleasure car division, Automobile Board of Trade, Madison Square garden, New York.
- January 6-20—Madison Square Garden show, New York City, Automobile Board of Trade.
- January 10-17—Annual show, Motor and Accessories Manufacturers, Madison Square garden, New York.
- January 10-17—Annual show, National Association of Automobile Manufacturers, Grand Central palace, New York.
- January 15-20—Twelfth annual show, commercial division, Automobile Board of Trade, Madison Square garden, New York.
- January 18-20—Annual meeting Society of Automobile Engineers, New York.
- January 20-26—Milwaukee show.
- January 22-27—Show at Providence, R. I.
- January 22-27—Show at Detroit, Mich.
- January 27-February 10—Eleventh annual show under the auspices of the National Association of Automobile Manufacturers, Coliseum, Chicago.
- February 5-10—Annual show, Pleasure Car Exhibit, St. Louis.
- February 12-17—Annual show, Commercial Car Exhibit, St. Louis.
- February 12-17—Show at Kansas City, Mo.
- February 14-17—Show at Grand Rapids, Mich.
- February 17-24—Show at Newark, N. J.
- February 17-24—Minneapolis show.
- February 19-24—Show at Hartford, Conn.
- March 2-9—Pleasure car show, Boston.
- March 4-9—Show at Denver, Colo.
- March 13-20—Show of Boston Commercial Motor Vehicle Dealers' Association, Mechanics' building, Boston.

* Sanctioned

do likewise. It is believed this will stimulate greater interest in the subject of highways.

President Taft will deliver the principal address on the opening day of the congress, which will be known as "national day." Other distinguished speakers on this day will be Governor William H. Mann, of Virginia; Senator Thomas S. Martin, of Virginia; Dr. Walter Page, editor of the *World's Work*; President W. W. Finley, of the Southern Railway; General T. Coleman DuPont, who is presenting to the state of Delaware a \$2,000,000 boulevard; Hon. J. Hampton Moore, president of the Deeper Waterways Association, and Hon. John H. Fairbank, member of congress from Alabama.

The second day will be known as highways engineers and contractors' day, and will be devoted to practical problems of highway construction, with addresses by expert road builders from this and other countries. The third day will be road users' day, and the exercises will be under the auspices of the Touring Club of America.

INSPECT SOUTHERN ROADS

Atlanta, Ga., Oct. 30—A good roads scouting trip through Georgia, South Carolina, North Carolina and Virginia, under the direction of the Touring Club of America, for the purpose of securing accurate road information as an aid to the forthcoming tours from different points in the south to the American road congress to be held at Richmond, Va., November 20-24, started from the headquarters of the southern department of the Touring Club of America at Atlanta today. The tour will be run under the auspices of the American Association for Highway Improvement and the Capital Highway Association. It is expected that the trip will cover a period of 5 or 6 days. The route laid out covers nearly 800 miles.

The first leg of the southern tour from Washington to Atlanta, from the national capital to Richmond, was surveyed by the official cars of the touring club in July and the forthcoming Atlanta to Richmond run, passing through the capitals of all the seaboard states, completes the entire route of approximately 1,000 miles.

REAR AXLE QUESTION SETTLED

Detroit, Mich.—The differences and litigation that have existed for several years between the Timken companies and Lindsay and Harmon of Indianapolis, regarding the Lindsay patents on rear axle constructions, under which the Timken companies has been operating, have been amicably settled and adjusted; and the Timken-Detroit Axle Co. retains complete shop rights under these patents.

Annual Chicago Motor Club Reliability

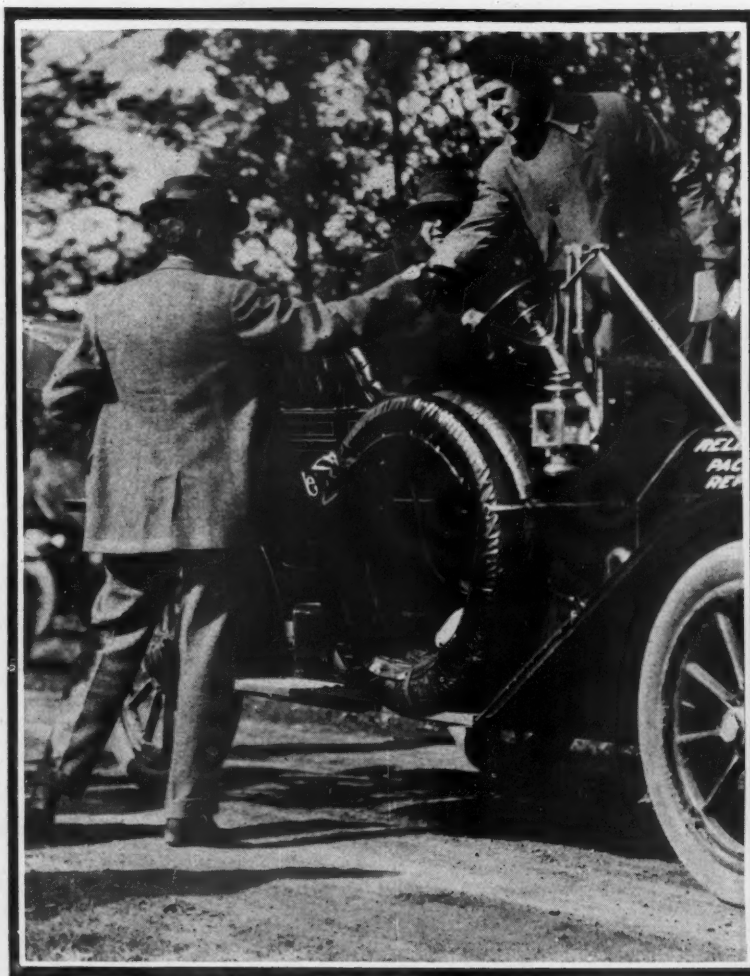


A FORCED HALT FOR NATIONAL PRESS CAR IN CHICAGO TOUR

LOUISVILLE, Ky., Oct. 29 —The fifth annual reliability run of the Chicago Motor Club, which started from Chicago Friday morning with seventeen contestants and five official cars, has completed two legs of the 8-day tour that has been mapped out by the Chicago organization. Illinois, Indiana and part of Kentucky have been traversed and as yet nothing has been accomplished toward deciding the winners. Only one of the seventeen cars has been penalized and that only for trivial troubles brought about largely by the inexperience of the driver—an amateur who put in his big National roadster for the fun of it. Certainly sixteen cars clean after 404 miles of going is a most remarkable showing, a showing such as never before has been made in a Chicago reliability.

The tour got an auspicious start from Chicago Friday morning, with only one car scratched, that a Lion that was pulled out because the change of date did not suit the entrants. This left nine running in the touring car section and eight in the roadster division, striving for four prizes—the touring car cup, the Van Sicklen roadster trophy, the Chicago Motor Club team trophy and the fuel economy prize offered as usual by the Standard Oil Co.

Seventeen Cars Take Part in Big Middle West Event, Route Taking in Indianapolis, Louisville, Cincinnati, Columbus, Detroit and Grand Rapids—Six Perfect Scores Lost in First 4 Day's Running—Good Roads Found in Kentucky and Indiana



GEORGE ADE AS MOTORISTS' HOST

Contestants in Chicago Motor Club reliability were entertained at Hazelden farm the first day by celebrated novelist and playwright. The illustration shows Mr. Ade bidding farewell to the referee in Velie pacemaker

The first day's run was from Chicago to Indianapolis over a route that differed from the conventional in that it followed a new trail that led past Hazelden farm, the home of George Ade, the novelist, who had invited the motorists to make his place the noon control. It was 94 miles to this place and it was easily negotiated, even though the contestants had to make a 5-mile detour just out of Crown Point because a new stone road that was included in the original route had not been opened to traffic. The stop at Ade's long will be remembered by the contestants. The novelist gave the motorists the run of the farm, and the noonday meal was served by the Daughters of Ruth, who are raising a fund to build a church. The novelist also had a "life-saving" station on the second floor, which was greatly appreciated by the motorists after the cold drive. He also provided them with souvenir postal cards, already stamped. Of course each man wrote one and Ade agreed to mail them. This gave him an opportunity to crack a merry joke. In writing for the Indianapolis Star of the visit of the Chicagoans, Ade dryly added: "I have read all the souvenir postal cards left here to be mailed and I find that the visitors were wildly enthusiastic

Contest Swings Through Five States

about the dinner that was served them."

It was no trick at all to drive from Ade's to Indianapolis, although the distance was 130 miles and everyone got in on time and with plenty to spare. The work of the technical committee was easy, for there was only one card to consider—that of Paul Strauss, driver of the National, who had drawn 3 points for carbureter adjustments at the start, undoubtedly caused by the chill weather. All others were clean and no one had any complaints to make.

In the evening the Chicagoans were the guests of the newly formed Hoosier Motor Club and the evening was devoted to speeches by men prominent in the motor world.

Indianapolis to Louisville

The run from Indianapolis to Louisville yesterday only was 178.5 miles, but it proved an eye-opener to the Chicagoans who had not realized that right at their doors is a touring territory that cannot be beaten anywhere in the country. Certainly the Berkshires can offer nothing better in the way of scenery and the roads through southern Indiana and that portion of Kentucky running into Louisville cannot be improved upon much. The Chicagoans struck the beautiful scenery about 20 miles from the noon control, Bedford. Just outside of Medora, 83 miles from Indianapolis, was encountered a most remarkable hill which would have been a serious proposition had it rained. It is about $\frac{1}{2}$ mile in length and the average grade is about 16 per cent. It is a veritable corkscrew, with little short turns that wind not abruptly but continuously to the top. There must be not fewer than ten turns on the way up—in fact it is like climbing a chimney. The road itself is excellent and the road winds through a thick wood that but adds to the beauty of the climb.

Leaving Bedford at noon, the tourists



ROADS AND SCENERY FOUND NEAR BEDFORD, IND.

found they had but just tapped the southern beauty vein. The magnificent roads continued and one hardly was well away from Bedford before there was encountered a most remarkable freak of nature—a hogsback road that ran for about a mile on the top of a sharp ridge between two beautiful valleys. One could look either way and drink in the scenery. On one side was a winding river and on the other heavy woods. The road itself took up the full width of the ridge and no driver dared take his eye off the highway to peek at the scenery lest he plunge into a chasm.

Hardly had they passed this beautiful stretch than the winding road brought them face to face with a hill that made Algonquin pale into insignificance, a 20 per cent grade that rose abruptly from the valley road. Luckily it was straight and the road good else there might have been

trouble. No one, however, experienced any trouble getting up.

This fine road continued to within about 30 miles of Louisville. At one place it followed an interurban trolley, being first on one side and then on the other. Someone counted and declared afterwards that this trolley line was crossed no fewer than twenty times before the trail straightened out and swung into Louisville.

Beauties of Indiana Roads

Reaching here yesterday afternoon, the tourists looked back over the day and marveled at the wonders. They declared themselves astonished at the fine roads of southern Indiana. It was surprising, too, because there were so few motor cars encountered on the road, while the inhabitants themselves did not seem to be overburdened with wealth. Yet there were found well built roads, wide and rutless, with stone bridges at some places and, best of all, these roads have every appearance of being maintained. The towns themselves seemed prosperous, but the day's journey failed to show any great motoring strength in this section. The people themselves seemed friendly to motoring and in each town the inhabitants gave the tourists the glad hand.

This trip of the Chicagoans seems destined to open the eyes of the western motoring world to the beauties that lay at its door. It is hard to realize that



CHICAGOANS STRIKE FIRST FORD ON TOUR

The Oldsmobile, contestant in the Chicago Motor Club reliability run, at the foot of the corkscrew hill near Medora, Ind.



BRIDGE OVER WHITE RIVER NEAR BEDFORD—VELIE PILOT LEADING RELIABILITY RUN

within a day's journey of Chicago there is a territory that is so rich in good roads and fine scenery as this and it is predicted that in another year the itinerary that is being followed by the Chicago Motor Club will be the scenic tour of the middle west.

The run from Indianapolis here failed to disturb any of the perfect score section. Strauss in the National drew 27 more points—14 for changing spark plugs and 13 for being late. The Case bent part of its steering connection trying to fol-

low the trail over a stretch of railroad ties, but this was whitewashed by the technical committee because the checker had failed to carry out the instructions of the referee. When the stretch over the tracks was reached the referee saw the confetti spread along it but he realized this was asking too much of the cars and he found a detour through a back yard and ordered the confetti strewn that way. The old paper was not picked up and the leading cars took the railroad route, the

Case meeting with its mishap in consequence. The referee held that the accident had been brought about by the failure of one of the officials to carry out orders and no penalty was imposed.

Resting up today, the Chicagoans this afternoon were the guests of the Louisville Automobile Club, which kept open house and devoted the entire afternoon to its guests.

From here the tour goes to Cincinnati tomorrow, Columbus Tuesday, Detroit Wednesday, Grand Rapids Thursday and home Friday.

Louisville to Cincinnati

Cincinnati, O., Oct. 30—Contestants in the Chicago run finished a double century trip from Louisville this afternoon and after the count was made tonight it was discovered that the remarkable record of the contest had been retained to a certain extent. Two drew black marks today, making three in all that have been demerited since the start of the run from Chicago last Friday. That fourteen cars could go 259 miles with perfect scores is a record seldom equaled in reliability contests.

The two to lose their perfect scores today were No. 107 Grout in the roadster division and No. 9 Staver-Chicago in the touring car class. The Grout met with its mishap this morning. Coming down a hill 40 miles out of Louisville it skidded and before Halbert could secure control of it, it had run off a bridge, ripped off a rear tire and broken a spring. The occupants had a close call. Halbert patched up the broken spring, incurring 40 points



PERFECT ROADS IN THE LIMESTONE COUNTRY OF INDIANA

thereby to which was added 8 points for being late. The Grout will get more tomorrow, for it is the intention to replace the broken spring. Monckmeier's Staver was given 7 points for adjusting a ball retainer in a front wheel bearing. This was the extent of the penalization, but one of the other perfect scores is threatened, No. 107 Moline, which is being driven by W. J. Boone. Going through Shelbyville at 12 miles an hour a negro driving a rig turned in front of Boone, who found it impossible to avoid a bump, the result being a bent fender, for which it may be penalized finally.

Through Picturesque Kentucky

The trip today again led through the picturesque portion of Kentucky and over good roads, too. It was sprinkling when the tour pulled out of Louisville for a 200-mile run but the rain was a gentle one and did not harm anyone. The roads being of stone construction, it was easy to keep going and no one worried over the weather. At Frankfort, the capital of Kentucky, the tourists were duly impressed with the high bluffs and the winding roads, but they were lost in admiration at Shakertown when they swung down a big mountain into the Kentucky river valley, the deep gorges and the rocky formations being of a grandeur to which the Chicagoans were not accustomed.

Lexington, the noon control, was reached after a trip of 116 miles and in the afternoon the tour was resumed over roads that were as winding as a corkscrew. One can get an idea of the twists by learning that the railroad was crossed thirty-seven times



MIDLAND CHECKER'S CAR ON CORKSCREW HILL.

during the afternoon between Lexington and Covington, Ky., the tourists never being more than a quarter of a mile from the railroad tracks. The Chicagoans also got their first toll-gate experience this afternoon, being forced to pay tribute five different times. They found, too, that the roads at this end of the day's run are not so good as in the morning. The rain had converted the roads into a muddy slime which made the drivers move cautiously. It was dark when most of them got into

town and there was considerable confusion in getting to the finish line because of the darkness.

This evening the visitors were given a royal reception by the Cincinnati Automobile Club, which put on a big stag and smoker.

From Cincinnati to Columbus

Columbus, O., Oct. 31—Today's run of the Chicago Motor Club's reliability, the fourth of the tour, from Cincinnati to Columbus, was prolific of incidents that



CASE ENTRY IN CHICAGO MOTOR CLUB RUN NEGOTIATING HILL NEAR MEDORA

happily resulted in no one being hurt but which decimated the perfect-score field by three and left eleven surviving for the honors of this classic. The Halladay and the Oldsmobile Autoerat in the touring car division and No. 104 Velie in the roadster class were demerited today, while Halbert in the Grout had to replace the spring he broke yesterday, which added considerable to his total.

The Halladay incurred 19 points, 3 of which were for cleaning the gasoline line and 16 for work on a fender iron that broke. The Oldsmobile started out with a broken gasoline line, small in itself but which grew like a rolling snowball until tonight there are charged against the Autoerat 455 points, while still more await it when the technical examination is made Saturday.

To start out with, the break in the line compelled Winters to take on gasoline three times, for which he was fined 9 points. Then at the noon control at Washington Court House he was obliged to lay up and take off the body to mend the leak. That cost 208 points. This done, the Oldsmobile started for Cincinnati, but a mile out of town in trying to pass a rig the car skidded, hit the horse-drawn vehicle and just escaped plunging down a 20-foot bank. It required nearly 3 hours to get out of this fix, the farmers being called on to help with horses. This made the Oldsmobile late tonight and the time penalty was 238 points.

The penalization of the Velie was slight, only 1 point for fixing the muffler cutout rod which had become disconnected. The Grout got 340 points today, 246 being used up in putting in the new spring, 2 for a clutch adjustment and 92 for being late at the noon control. The car was on time tonight. Another victim today was A. M. Robbins in the Abbott-Detroit 44, who broke a leaf in the front spring before he got out of Cincinnati. He did not have



CARS LINED UP FOR LONG ISLAND RUN

to touch it, however, and it looks as if he would be able to go through the tour with it, which would not cost him his perfect road score.

The penalization of the Velie and the Halladay leaves the Moline the only make clean for the team trophy, for which it has a chance, for this cup is decided by the two best aggregate scores. The Staver, the fourth contender, was penalized yesterday when Monckmeier caught it.

The run today was 178 miles from Cincinnati to Columbus, with the noon control at Washington Court House, 98 miles. The morning route ran through Dayton and the afternoon one touched Chillicothe. When the tourists left this morning the skies were cloudy and the roads muddy, following last night's rains, which made the going necessarily slow. During the morning only one really good stretch of road was encountered, that being the turnpike out of Xenia, 10 miles, to Jamestown, which is said to be the finest highway in the state of Ohio, which claim is backed up by the Chicago tourists. A mile a minute even for a touring car with top and windshield up and chains on was possible, as was demonstrated by Don Herr in the National press car. Washington Court House was found to be a motoring hotbed. There they have 450 cars owned among the 10,000 inhabitants

and from the interest displayed in the contest cars it is likely this enthusiasm is spreading.

The run tomorrow will be a hard one, Detroit being the destination. The roads between Toledo and Detroit are reported bad and it may be necessary to make a detour to get past some of the impossible stretches.

Wednesday Morning's Run

Toledo, O., Nov. 1.—Special telegram—All seventeen contesting cars in the Chicago Motor Club reliability checked in here at the noon control over 30 minutes ahead of time. The pacemaker increased its lead over the schedule of the first contesting car to 45 minutes and there was a long string of contestants behind it when 30 miles out of Toledo. The weather today has been colder, with a leaden sky, the sun breaking through the clouds for only a few minutes.

The route was through Marion, Upper Sandusky, Carey, Fostoria, Bradner and Pemberville. With the exception of 2 miles of mud the roads have been medium good. They are worn-out stone and gravel with the holes filled with water from the recent rains. There are several miles of rough new stone roads. An interesting part of the run was through the level oil country between Upper Sandusky and Bradner.



STICKNEY IN 104 VELIE

STANDING OF CARS IN CHICAGO MOTOR CLUB RELIABILITY

		TOURING CARS			
No.	Car and driver	1	2	3	4
1	Moline, N. Van Dervoort	0	0	0	0
2	Moline, Salisbury	0	0	0	0
3	Case, Hansen	0	0	0	0
5	Halladay, Daubner	0	0	0	0
6	Halladay, Davies	0	0	0	19
7	Oldsmobile, Winters	0	0	0	455
8	Abbott-Detroit, Robbins	0	0	0	0
9	Staver-Chicago, Monckmeier	0	0	7	0
10	Staver-Chicago, Knudsen	0	0	0	0
		ROADSTERS			
100	Moline, Wicke	0	0	0	0
101	Moline, Boone	0	0	0	0
102	Oakland, Bauer	0	0	0	0
103	Velle, Gibbons	0	0	0	0
104	Velle, Stickney	0	0	0	1
105	Bergdoll, Monsen	0	0	0	0
106	National, Strauss	3	27	0	0
107	Grout, Halbert	0	0	92	290

The territory is not an inviting one, the farm houses and barns not being so good and up-to-date as might be expected. Scarcely one-quarter of the oil wells are in operation. None of the cars had tire troubles or mechanical difficulties of any kind.

Owing to the recent rains this afternoon's run to Detroit will be through Ida, Dundee, Milan, Stoney Creek and Ypsilanti, instead of by way of Monroe and Trenton. The distance will be 76.3 miles.

DENVER PROTEST WITHDRAWN

Denver, Colo., Oct. 29—The winners of the Denver Times reliability tour were definitely settled when the Ford, awarded second place by the officials, withdrew its protest against the Flanders car, which was given the first money. There was some question between the two leaders as to whether or not stock cars were entered in the run, but after a thorough inspection of the machines by the officials in the presence of the contesting parties any doubts on the question were set aside and each admitted that the other had entered a strictly stock car.

Another ground of protest by the Thorney Auto Co., which entered the Ford, was that its car had been wrongfully penalized four points because of a loose radiator when the attention of the technical committee had been called to this fact before the tour began. This part

of the protest was overruled by Referee Ralph W. Smith, because no such notation was found on the preliminary inspection card, which, under the rules of the A. A. A., must show any defects of this kind found prior to the opening of the contest. There was one point in the protest, however, which was sustained by the referee. The technical committee penalized the Ford one point for loose muffler union, which should not have been done, for in all Ford cars the muffler is not connected with the muffler pipe except by an asbestos union. The penalty was wiped out, with the result that the revised Ford score was 18 points, only one more than that of the winning Flanders. The Cadillac, entered by Bert Hall, the local Cadillac representative, stands as winner of third place. It was thought for a time that the protest by the Ford entrants would be carried to the highest authority for a ruling.

Last night, at the rooms of the Denver Motor Club, O. S. Wilson, head of the Colorado Studebaker Vehicle Co., which entered the winning Flanders, was host to the contestants, officials and representatives of the Denver Times. A dutch lunch was served, after which Wm. D. Nash, president of the club, on behalf of the Denver Times, presented to the winners the prize money. The Flanders received \$750, the Ford \$150 and the Cadillac \$100. Barney Kane, driver of the Lozier pathfinder car, and Eaton McMil-

lan, driver of the National pace-making car, were surprised by the presentation to them of handsome gold fobs, in appreciation of their services in the tour.

VOGEL WINS SCHIMPF TROPHY

Brooklyn, N. Y., Oct. 28—The Schimpf trophy, contested for today by the members of the Long Island Automobile Club, was won by Louis A. Vogel, Jr. Twenty-six contesting cars left the headquarters of the club at 1 o'clock this afternoon in a run which was more a guessing contest than a trial of either drivers or cars. The cars were started simultaneously after each contestant had received a sealed envelope containing an arbitrary time schedule.

The run was over the roads of Long Island to Lake Ronkonkoma and back to the club house. At the finish of the run the envelopes were opened and the contestant whose actual running time came nearest to the arbitrary time as signed won the prize.

WATSON CUP GOES TO COWEN

Syracuse, N. Y., Oct. 28—After several postponements because of inclement weather, the Watson cup run, under the auspices of the Automobile Club of Syracuse, received its second annual repetition Wednesday. The run was made through a picturesque lake and hill country, with dinner at Cortland.

Forty-four cars participated in the run, containing 155 persons, of whom 40 were women. David Grody, one of the Ford agents for this section, came in for much good-natured raillery. Before the run he had announced that the firm would pay for the dinners of all occupants of Ford cars in line. The tally was 19 Ford cars, holding 65 persons.

Ernest O. Cowen, enrolled with the club the day before the run, came closest to the sealed time of 4:56:37. His time was 4:59:15, and he will retain the Watson trophy cup for a year. S. L. Devendorf was even closer, making it in 4:59, but he was not a club member, so could not receive the trophy. He was given a cup by the Ford concern for driving the Ford closest to the secret time.

ENTRIES IN THE LOS ANGELES TO PHOENIX RACE

No.	Car	Piston Displacement	Driver	Entrant
1	Maxwell	229	Clarence Smith	United States Motors
2	Pope-Hartford	299.4	W. D. Tremaine	W. D. Tremaine
3	Franklin	301.5	Ralph Hamlin	Ralph Hamlin
4	Stoddard-Dayton	550	E. Roger Stearns	Standard M. C. Co.
5	Cadillac	286	W. W. Bramlette	Don Lee
6	E-M-F	226.2	W. La Casse	Studebaker Co.
7	Flanders	154.8	Geo. Soules	Studebaker Co.
8	Cole	286	John Jenkins	Grundy Motor Sales Co.
9	Mercer	286	H. Hanshue	Leon Shettler
10	Case	236	W. F. Brong	W. F. Brong
11	National	448	Harvey Herrick	National Motor Car Co.
12	Buick	318	L. Nikrent	Howard Auto Co.
13	Flat	618	Teddy Tetzlaff	Fiat Co.
14	Midland	318	F. Siefert	Carrigan Bros.
15	Lexington	280.6	C. Bigelow	Burkardt-Crippen
16	Buick	318	J. Ferguson	J. Ferguson



START OF SOCIABILITY RUN OF SYRACUSE AUTOMOBILE CLUB

READY FOR LONG RACE

Los Angeles, Oct. 30—Sixteen desert-equipped motor cars will start on a 550-mile battle with the mountains and sand at 10:45 Saturday night. The start will be from Los Angeles and for 2 days and 1 night these cars will be covering the distance across the great American desert between Los Angeles and Phoenix. As a road race this will be unique. A 550-mile road race is double the distance of the average road contest, but in this case, instead of the smooth-surfaced boulevard, the worst roads in America have been selected, and it is over this road that fifteen American and one foreign machine will race.

Observations Made on Trade Outlook

JACKSONVILLE, Fla., Oct. 26—That the south is a one-crop country and that business conditions are most seriously affected by a low price or a bad yield in that one crop, is rather unpleasantly brought home to one who travels over the route of the Glidden which has just ended.

The south's crop is cotton, and it is a billion-dollar product. This year has been a marvelous one for cotton. There were nice rains after cotton was planted. Then came a semi-drought that held back the boll weevil. Then came just enough rain to produce a full yield. The cotton is not all picked yet. But nothing can happen to change the yield. Rains now would only lower the grade. And the result has been extreme overproduction and half-price cotton. All of which means that the motor car business in much of the south this year will not be as good as it should be.

In the past 3 years cotton has averaged practically 14½ cents. Now it is hovering below 9 cents, with the spinners holding off until it goes to 8 cents. The normal crop is virtually 11,500,000 bales. This year the production will be between 14,000,000 and 15,000,000 bales. The consumption is only about 12,000,000 bales and the rest will be carried over to next year.

All of which may not interest the general reader, but it does the man who has motor cars to sell. For the cotton crop is the money crop of the south. The southern farmers are not going to be hard pressed this year for food. They have raised enough to carry them through. But their money crop is not bringing what it costs to raise it. And there will be little spending money—and hence few cars bought.

Gloomy Outlook in South

These may seem like gloomy facts, but they are facts that are brought out by careful investigation all along the line of the 1911 Glidden. Up in Maryland, Virginia, West Virginia and North Carolina, where the apple crop and the wheat, corn and tobacco crops decide prosperity, people are doing well. The tobacco crop, all important in North Carolina, is a shade off this year. But the price is up a trifle—enough to counterbalance and even things up. In these states, despite dry weather, conditions are good and as nearly as can be judged there should be a 25 per cent greater demand for 1912 cars than there was for 1911 machines. In the cotton states of South Carolina and Georgia, where King Cotton rules, the demand must necessarily be off, perhaps to the extent of 25 per cent. The exact decline in demand cannot be told for certain until it is known where cotton will eventually drop to. Of course in the cities there

will be no great falling off in demand, though it cannot be denied that when cotton goes down every man in the cotton section, from the beggar to the banker, feels the effects.

Folk at the southernmost end of the Glidden tour will not feel any ill effects, because in Florida cotton is not a big crop. The people depend rather on turpentine and its allied products, lumber, oranges, grapefruit and tourists. And the 1911 crop of all these, and especially tourists, was exceptionally large.

Gliddenites in Dixieland

The Glidden tour's first stop in Dixieland was at Winchester. The trip from Gettysburg there carried the tourists through a beautiful section of the country and through continued evidences of prosperity. To the roadside observer, apples and wheat appeared to be the chief crops. At Winchester about a dozen cars are actively represented—Maxwell, Everett, E-M-F, Flanders, Hudson, Cadillac, Buick, Oakland, Hupmobile, Ford and Brush, all moderate-priced or cheap cars, it may be observed. In and immediately around Winchester seventy-five cars are owned. Fully fifty of these were sold in 1911, and an estimate that seventy-five will be sold in 1912 is regarded as conservative. One dealer who sold fourteen machines last year has contracted for twenty in 1912.

Winchester is an apple center. Frederick county, in which it is located, will ship nearly 300,000 bushels of apples in 1911. These are worth approximately \$600,000. Frederick county and the adjoining county in West Virginia, Berkeley, claim to ship more apples than the whole state of Oregon. Fine live stock is raised in that section—jumpers, Percherons, and general heavy draught stock. The crop conditions were fine, despite an incipient draught in early summer.

The Gliddenites' first night stop in the real south was at Staunton, Va.—pronounced Stanton, if you please. It is a good motoring town, too, in a good motoring country, where crop conditions have been good and everybody seems to have money. The town claims but 12,000 inhabitants, yet it has 200 cars and several garages, one of which cost \$60,000. In Staunton the Chalmers, Oakland, Olds, Hudson, National, E-M-F, Flanders, Franklin, Reo, Maxwell, Columbia, Mitchell and Ford are actively represented. About eighty machines were sold in Staunton in 1911 and this will easily go to 100 in 1912. The Beverly garage, for instance, sold sixty-two cars of the 1911 make and has contracted for twenty-five Chalmers, fifty Oaklands, three Olds, and probably will close for five Packards for 1912. This garage agreed also to take 100 Fords if it could get the line,

but has not been able to close a contract as yet.

Staunton is located in Augusta county. Before the Civil War it extended to the Ohio river. Even now it is very large and contains 80,000 people. The country is agricultural, and wheat, corn, oats, barley and apples are raised.

They tell tremendous apple stories in that section. For instance, one man in the county, J. S. Craig, made \$36,000 this year on apples. For many years his minimum profit from apples has been \$30,000. His boast is that he never had a bad year, and to make it good he bought 5,000 oil stoves last year, at a cost of \$30,000, to protect his trees from frost. This man, by the way, drives a \$500 car and offers an excellent target for some enterprising agent.

Garages in the South

The Beverly garage, managed by Edward Woodward, claims the honor of being the best appointed garage in the south, and as noted an authority as Philander C. Knox, who inspected it recently, pronounced it as complete in equipment as any he had seen on two continents. This garage, built by Staunton business men, depends largely on north-and-south touring for its patronage. There is a solid macadam pike from Staunton to New York, by way of Harrisburg, and 500 cars a month go through on the north-and-south route.

After the Glidden tour passed Staunton it struck mountainous country and poor territory for the motor car salesman. Natural Bridge, for example, one of the noon stops, has no agency, though it maintains a garage for visitors. In that country if a farmer owns \$5,000 he is regarded as rich, and few of them have anything but their land.

Once out of the mountains and headed for Roanoke, the tourists found themselves in a prosperous country again, and Roanoke itself, though an unholy place to reach by motor car, seems a pretty good motor town after you get there. The cars represented there are Reo, Maxwell, Mitchell, Oldsmobile, Cadillac, National, Peerless, Chalmers, Hupmobile, Packard, Franklin, E-M-F, Flanders, White, Motor-ette, Abbott-Detroit, Ford, Warren-Detroit and Overland. There are five garages in the city, three of which are in their own buildings. Roanoke dealers report that the sales conditions are good but that competition and price-cutting are bad. The second-hand car situation is particularly aggravating, and the curb brokers have cut deeply into the profits of the regular dealers.

In Staunton dealers reported that 10 per cent of their 1911 sales was to motorists but that 75 per cent of their 1912 inquiries was from farmers. In Roanoke

Along the Recent Glidden Tour Trail

a couple of dealers said that they had done more business in 1911 models in the country than they had in the city, and that they expected to repeat the trick in 1912. Roanoke is located in farming country. Tomatoes are one of the most valuable crops, with apples second. Two adjacent counties raised something like three-quarters of a million dollars' worth of tomatoes in 1911. All crops were reported good, despite early droughts. South of Roanoke is a famous grazing country, notably in Tazewell county, where there is natural bluegrass. Beef for export is raised there and the farmers make all sorts of money.

Martinsville, the fifth noon stop of the Glidden tour, is a town which claims but 5,000 inhabitants and is no great motor center—which was lucky, because it was not reached by the Glidden tourists until black-dark on that notoriously wretched October 18, and there was little time for investigation in the 15 minutes that were allowed to take on water, gasoline, oil, food and drink.

The town boasts one garage, which sells Wintons, Cadillacs, Oaklands, Overlands and Buicks. It has just gone into the business. Martinsville is a farming district and situated in the northern edge of the tobacco country. Crop conditions have been good.

Winston-Salem's Strength

Winston-Salem, a snug little city of 33,000, the fifth night stop of the Glidden tour, boasts of 250 cars owned in the city and points particularly to the fact that low-priced machines and high-priced ones are conspicuously absent from the list. It is a city of medium-priced cars. The machines most actively represented are the Pierce-Arrow, Oldsmobile, Mitchell, Buick, Cadillac, Schacht, and the Gramm truck. The dealers in this section do not seem to expect much more business with 1912 models than they had with 1911 machines. One dealer, for example, who represents two cars for the state of North Carolina, sold 150 machines in 1911 and has contracted for 175 in 1912, a most modest increase. The feeling seems to be that the market is pretty well sold up.

Except for tobacco factories and cotton mills there is little manufacturing in the section about Winston-Salem, and the country is very largely agricultural. Tobacco, of course, is the main crop. Twenty million pounds of loose leaf tobacco are sold each year at auction on the floors of Winston-Salem, and 40,000,000 pounds are manufactured in the city. The tobacco crop is only about 75 per cent of the normal in the Winston-Salem territory, but high prices are looked for. The tobacco farmers, as a rule, are not well off and do not offer much opportunity to the automobile salesman.

With Winston-Salem to the north the tourists began to get out of the tobacco country and into the cotton belt. At Salisbury, N. C., the next stop, tobacco had ceased to be an issue, except for smoking purposes. This town numbers 140,000 people, so it claims; but apparently is no great motor car market. The cars most strongly represented are the Stoddard-Dayton, Courier, and Hupmobile. There is but one garage. The country surrounding Salisbury is given over to farming, and cotton, wheat and corn are the chief crops.

In the Piedmont Section

Charlotte, N. C., proved one of the big towns of the trip, and a good motor center it appeared. It has wondrous roads and is in a comparatively rich section of country. It claims 42,000 inhabitants and the following cars are represented there: Buick, Hupmobile, Overland, Flanders, E-M-F, Chalmers, Elmore, Reo, Case, Pullman, Hupp-Yeats, R. C. H., Motorette, Ford, Maxwell and Columbia.

Charlotte, like most cities in the cotton belt, is a trifle uncertain about 1912 demand. One large dealer has increased his contracts an even 15 per cent over 1911, while the United States Motor Co.'s branch, which distributed 556 cars in the two Carolinas last year expects to place more than 700 this year. In Charlotte about 345 cars are owned.

This part of the country, known as the Piedmont section, has raised much cotton and some wheat and corn this year. It is demoralized somewhat by the price of cotton, but this has its advantages, for it means that the cotton mills will be busy. A vast amount of cotton is manufactured in and about Charlotte. Nearby Gastonia, for example, has eighteen cotton mills, one of them a million-dollar enterprise.

From Charlotte on to Atlanta and then on down to the very southernmost limits of Georgia the tourists passed through an almost unbroken cotton field. And everywhere there was evidence of a tremendous crop—and of a spirit of apathy as to whether it was ever picked or not.

Spartanburg, S. C., the next stop beyond Charlotte, is another great manufacturing center for cotton products. It claims to be second only to Lowell in the number of cotton spindles and to lead the south. The city, which numbers 25,000 people, owns 375 cars. About 100 were sold last year, and the dealers plan to sell fifteen of 1912 models. One dealer, for example, who sold forty-nine machines last year, has contracted for eighteen-five in 1912. The cotton farmers in this section are small and not motor car buyers, anyway, and the mill owners and employees should have a busy and prosperous year. Spartanburg has three dealers and two

garages. The following cars are represented: White, Maxwell, Overland, Baker, Marion, Cartecar, Flanders, E-M-F, Chalmers and Reo.

Anderson, S. C., was the last night stop of the Glidden run before Atlanta was reached, and a lively little city it proved. It claims a directory population of over 16,000, has four garages, and the following cars actively represented: Firestone-Columbus, Overland, Reo, Ford, Schacht, E-M-F, Flanders and Chalmers. There are nearly 400 car owners in Anderson county and probably 175 in the town itself. A large majority of them were sold in 1911.

Anderson, located in a rich cotton-growing country, finds itself worried over the low price of cotton. One dealer, who has the state agency for Firestone-Columbus, sold 150 machines in 1911 and has contracted for 200 cars for 1912. This man—J. S. Fowler—doubts if he can live up to his contracts, owing to wretched cotton prices.

Once in Atlanta, the tourists felt that they were in a city where motor car selling was on a firm basis. The parade of cars that greeted the Glidden tour spoke with eloquence, both of the number of machines and the sort of cars owned in the Gate City of the South.

Changes come so rapidly in Atlanta that it is hard to tell what cars are actively sold there. Fifteen branches and about a dozen live agencies are represented in the Gate City. A careful canvass among dealers and branch managers indicates that the poor price of cotton is not going to make any difference with the dealers in medium and high-priced cars. The Cadillac and Cole agencies, for typical examples, have not felt the tightening up that comes usually when cotton is off. Both will do about 20 per cent more business than in 1911.

Conditions in Florida

The same story was told after the Glidden tour left Atlanta and clear down to the Florida border. Macon, a very live town in a motor way, reported an excellent business in high-priced machines, a fair business in medium-priced cars, and very little doing in cheap cars. Cordele and Valdosta, the next two stops, were small places and of minor motor car importance, and the same was true of Live Oak, the last night stop.

Jacksonville proved another live motor city. This is the gateway of the state of Florida, and as Florida depends on naval stores, fruit of various sorts, and the tourist business for its money, and as all of these industries are good producers at present, this city furnishes an excellent motor car market. Florida apparently will not feel in the least the depression that has hit its sister states as a result of cheap cotton.

Savannah Counting Its Race Entries

Starter Wagner Notifies Georgians of Receipt of Sixteen New Nominations, and Names Many Makers Who Are Contemplating Taking Part in Thanksgiving Week Speed Carnival

Savannah, Ga., Oct. 28.—In a telegram today received by President Harvey Granger, of the Savannah Automobile Club, from Starter Fred Wagner, who is at present at work securing entries for the races here next month, he states he has sixteen new nominations besides those already announced for the four events, making the total number of cars to be seen here twenty-one with over 15 days in which to get more. According to the telegram sent by Wagner the following cars have been entered: Three Flanders cars in the Tiedeman trophy race; three Marmons in the Savannah challenge cup; two Marmons in the Vanderbilt; two Marmons in the grand prize race; two Abbott-Detroits in the Savannah challenge trophy; two Abbott-Detroits in the Tiedeman cup race. The cars which have already been entered are three Benz for the grand prize and two Cases for the Savannah challenge trophy.

Those who have positively promised to enter are: Two Mercer cars in the Savannah challenge trophy race; one Mercer in the grand prize race; three Fiats in the grand prize; two Lozier cars in the Vanderbilt; two Loziers in the grand prize race; two Mercedes in the Vanderbilt race; one Mercedes in the grand prize race; two Nationals in the Vanderbilt race.

Besides these, letters for reservations for cars and drivers have been received from the following manufacturers, showing that they will have cars here: Henderson Motor Sales, two Coles; Ohio Motor Car Co., two Ohios; Buick Motor Car, two Buicks; Pope-Hartford, two; Sears, three; Staver, three; Opel, one; Colby, three; S. G. V., one; Ford, possibly one; Westcott and Velie, not decided yet.

While the number of actual entries for the various races at Savannah, November 27 and 30, is yet small, the fact that there will be a record-breaking entry list is attested by the letters that are being daily received requesting reservations and quarters for the various racing teams, and it now seems probable that there will be more than seventy-five cars entered in the four events. Starter Wagner states that the number may go as high as ninety.

The latest team to obtain quarters is the Mercedes, which will enter two cars in the Vanderbilt cup races. Another Mercedes entry has been previously promised, that of Spencer Wishart, who owns his own machine. It is expected that Wishart's car will be entered in the grand prize.

The Mercedes Automobile Co. has accepted the assignments of its cars at

Bonna Bella, where the camp will be located by the first week in November.

The J. I. Case Threshing Machine Co. will have two of its Case cars in the Vanderbilt cup races, and have been assigned a camp at Isle of Hope at Barbee's pavilion. The cars and drivers will take charge of their quarters here the first week in November, when the famous Chatham county roads will be open for practice.

Two new grand prize racing cars have just arrived by the steamship Vaderland and will be ready for shipment to Savannah between November 10 and 15. It is expected that the cars will arrive in Savannah at the same time that Hemery arrives from Europe. Eddie Hearn will be the other Benz driver. The new car is identically the same as the one with which Bruce Brown won the grand prize last year, one of them being the old car used by Bruce Brown last year.

The sale of reserved seats and boxes for the grand prize, the Vanderbilt cup, and the light-car races at Savannah, Thanksgiving week, far outstrips any previous sale, and the management is now considering the construction of 100 additional boxes in order to meet the demand.

SCHIMPF CONTEST CHAIRMAN

New York, Nov. 1.—Special telegram—William Schimpf, president of the Long Island Automobile Club and member of the A. A. A. contest board for the past year, has been appointed by President Robert P. Hooper to fill the vacancy caused by the death of the late Samuel M. Butler. The appointment followed a conference involving President Hooper, of the A. A. A., and President H. E. Coffin, of the Manufacturers' Contest Association, which co-operates with the owner's organization in the conduct of motor competition. Mr. Schimpf is the head of one of the largest motor clubs in this country and is naturally greatly interested in competitions, his service on the board having given him a complete understanding of the needs of the position to which he has been appointed.

PHILADELPHIA ROAD RACE PROFITS

Philadelphia, Pa., Oct. 30.—Fred C. Dunlap, chairman of the contest committee of the Quaker City Motor Club, today submitted to Mayor Reyburn a report of the receipts and expenditures of the Fairmount Park 200-mile road race held on Monday, October 9. The statement shows that a smaller sum than ever before will

be turned over to the beneficiaries—in this instance the police pension fund and the fairmount park guard pension fund. The total sum realized above expenses amounts to \$3,036.57, of which the first-named fund will receive \$1,518.29 and the park guards \$1,518.28. Originally it was intended to include the children's playground committee in the distribution of the profits, but that organization was eliminated by reason of the disappointingly small amount left after the expenses had been paid.

In detail the statement shows receipts, which embraced the sum realized from the sale of parking spaces and grandstand seats, of \$8,527, from which expenditures amounting to \$5,490.43 were deducted, leaving a profit of \$3,037.57 for the charity fund. The expense fund was larger than it ordinarily would have been, by reason of the fact that it contained an item of \$1,395.64 for repairing the roads in Fairmount park, an expense that heretofore was borne by the municipality, but which this year devolved upon the Quaker City Motor Club to pay out of the money that was donated to charity.

The Q. C. M. C. came out of the race on the wrong side of the ledger. The actual expenses of the race amounted to \$9,422.37. The club's receipts from entrance fees only footed up to \$8,500, leaving a deficit of \$922.37.

ROAD MOVEMENT IN TEXAS

Austin, Texas, Oct. 28.—The commissioners' court of Tarrant county has just ordered an election for Nov. 25 to vote on the proposition of issuing \$1,600,000 of bonds for the construction of roads and the erection of bridges. The Tarrant County Good Roads Association has inaugurated a vigorous campaign in behalf of the proposed bond issue, and it is the opinion of R. M. Davis, chairman of the association, that the proposition will be supported by a large majority of the taxpayers of the county.

One of the features of the Texas land exposition to be held in Houston, January 15-28, will be a demonstration of modern methods of constructing good roads. It is arranged that expert road builders and the most improved machinery shall be on hand and the test made as thorough and instructive as possible.

It is estimated that Texas now has about 5,000 miles of improved highways, and that there is under construction and proposed at this time an additional 2,000 miles, which will be finished within the next few months. Texas needs more than 25,000 miles of good roads in order to bring her up to the standard of some other states.

Taxpayers of Reeves County have presented a petition to the Commissioners' court asking that an election be called at an early date to vote on the proposition of issuing \$200,000 of good roads bonds for that county. It is thought the application will be granted and the bond issue

will carry. This is one of the comparatively newly settled counties, and the increase of population has been so rapid that the necessity for better roads is beginning to be severely felt.

In Wharton county the taxpayers are agitating the question of voting a large issue of bonds to construct good roads. One of the roads to be constructed through the county will be a part of the highway that is to be built between Galveston and Houston and Corpus Christi, following the gulf coast.

Bonds are issued by the taxpayers of Calhoun county for the construction of a 60-foot highway from Port Lavaca to a point on the Guadalupe river, opposite Tivoli. It is planned that this road shall be continued through Refugio and San Patricio counties to Sinton. At the latter point it will connect with the proposed highway that is to be built between San Antonio and Corpus Christi. Bonds will also be issued in Calhoun county to construct a good road from Port Lavaca to Port O'Connor.

In Williamson county good progress is being made in the construction of good roads, for which bonds have been issued to the amount of \$300,000. Before this bond issue was voted that county had 150 miles of macadam roads. The taxpayers of Matagorda county have voted \$160,000 of bonds for road improvements.

GOVERNOR DEDICATES ROAD

Columbia, Mo., Oct. 28—When Governor Hadley, of Missouri, dedicated the old trail route of the cross-state highway today he marked the beginning of the end of bad roads in this state. Fifty-seven motor car loads of good roads enthusiasts from Kansas City and forty-six from St. Louis met here.

Governor Hadley, who made the dedication speech, was introduced as the nation's greatest road builder. He said in part:

"The men and women who are responsible for the construction of this first cross-state highway are as truly pioneers in the work of civilization as were the ancestors who first blazed a pathway for travel from the banks of the Mississippi to the shores of the Pacific. And this old trail route is indissolubly associated with that great western movement which has as its result the winning of the west."

MEANS ROADS FOR OKLAHOMA

Oklahoma City, Okla., Oct. 27—The advent of the motor car as a means of transportation and pleasure in the rural districts has driven the farmers into a condition of good roads enthusiasm which borders on a craze. Farmers of Oklahoma county have joined with the citizens of Oklahoma City, the county seat, in obtaining 6,000 signatures to a petition asking the county commissioners to call an election the last week of November to vote on a bond issue of \$1,250,000

Engineers Start on Trip to Europe

Fifty-Five Persons Board the Mauretania, Thirty-Nine of Whom Are Members of the Society—Others Will Join the Expedition Later on the Continent—Personnel of the Party

NEW YORK, Nov. 1—At 9 o'clock this morning a party consisting of fifty-five persons representing the Society of Automobile Engineers sailed for England on the steamer Mauretania on the first official visit of that organization to foreign shores. The S. A. E. was invited to hold a joint convention with the Incorporated Institution of Automobile Engineers of England, and the present trip is the outcome. The roster of the party includes: B. B. Bachman, Ardmore, Pa.; Mr. and Mrs. Walter C. Baker, of Cleveland, O.; Mr. and Mrs. J. S. Bretz, New York; Mr. and Mrs. Albert Champion, Flint, Mich.; Mr. and Mrs. H. D. Church, Detroit, Mich.; Mrs. D. H. Church, Cambridge, Mass.; Coker F. Clarkson, New York; Mr. and Mrs. Howard E. Coffin, Detroit, Mich.; John A. Crowley, New York; Arthur B. Cumner, Philadelphia; E. A. Dewaters, Flint, Mich.; H. F. Donaldson, New York; F. S. Duesenberg, Des Moines, Ia.; B. G. Ellis, Boston, Mass.; John W. Foster, Amesbury, Mass.; C. H. Foster, Cleveland, O.; H. Jay Hayes, Detroit, Mich.; Robert T. Hendrickson, Fremont, O.; J. B. Hull, Cleveland, O.; Wm. Kelly, Detroit, Mich.; Geo. W. Kerr, Chieopee Falls, Mass.; Hugh Kerr, Buffalo; Chas. B. King, Detroit, Mich.; Mr. and Mrs. W. P. King, Cleveland, O.; Mr. and

Mrs. Robert McA. Lloyd, Long Island City, N. Y.; D. G. McDiarmid, Chicago; Mr. and Mrs. Alden L. McMurty, New York; Carl J. Metzger, Ottawa, Ill.; Wm. E. Metzger, Detroit, Mich.; Mr. and Mrs. Chas. J. Moore, Detroit, Mich.; Bert Morley, Detroit, Mich.; C. S. Mott, Flint, Mich.; Ralph H. Rosenberg, Columbus, O.; A. H. Slade, New York; C. O. Snyder, Chillicothe, O.; Paul L. Snutsel, New York; H. C. Stutz, Indianapolis, Ind.; H. T. Thomas, Lansing, Mich.; T. R. Thomas, Racine, Wis.; G. R. Wadsworth, Cleveland, O.; W. G. Wall, Indianapolis, Ind.; Mr. and Mrs. G. A. Wahlgreen, Denver, Colo.; Mr. and Mrs. Henry C. Wilson, New York; John G. Wood, Indianapolis, Ind.; Mr. and Mrs. S. G. Wingquist, Gothenburg, Sweden.

The following members will join the party in Europe:

A. Ludlow, Clayden, London; C. E. Davis, Muncie, Ind.; Marcel Dejarney, London; Chas. L. Lawrence, Paris; Fritz Loeffler, Walhof, Germany; Louis C. Marburg, New York; A. J. Moulton, New York; A. J. Meyers, Paris; Rene M. Petard, Paris; Adolph Rosener, Bridgeport, Conn.; Alfred J. White, Coventry, England; David R. Wilson, Cleveland, O.; Arthur Ziltener, Wessen, Switzerland, and others.

for the purpose of building two main roads through the county and connecting a number of laterals which are designed to reach every town in the county. The mileage of the district as outlined calls for 154 miles of hard roads.

OHIO ROAD LEVY UPHELD

Cleveland, O., Oct. 31—Road building in Ohio was given a distinct boom this week by a decision of Judge E. B. Dillon, of the Franklin county common pleas court. The state tax commission sought to prevent the county commissioners from making an extra levy for road repairs. The new Smith 1-per-cent law repealed all other taxing laws of Ohio, except one providing for an assessment not to exceed 5 per cent for emergency road repair work. Under this law a hardship was worked in many sections of the state, which found themselves without funds for road building. The test case decided this week was brought for the purpose of determining the rights of officials under the emergency levy law. The court held that commissioners may, under the law, make such levy as they deem necessary for repair work, not exceeding 5 per cent, even though no extraordinary emer-

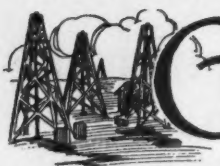
gency has arisen. The decision will furnish relief from an embarrassing situation in many Ohio counties.

DENVER SHOW IN MARCH

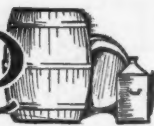
Denver, Colo., Oct. 30—The annual Denver motor car show will be held in the Auditorium the week of March 4th. The announcement was made after a canvass of the interested dealers, and an investigation of the possibility of securing the big municipal exhibition hall. There is every indication that the Denver show will be most representative of the cars, accessories, manufacturers and dealers interested in the territory between the Mississippi river and the Pacific coast. In addition to the display of gasoline, electric and steam propelled vehicles for pleasure purposes, space will be set aside for the display of commercial cars and motorcycles will be given room.

SPEEDWAY PLANS FOR NEXT YEAR

Indianapolis, Ind., Nov. 1—It was officially announced today that the second annual 500-mile race on the speedway will be run May 30, 1912, despite the protests of the G. A. R. It also has been decided that the Wheeler & Schebler trophy race will be run on Labor day.



Gasoline



There is no subject concerning which we receive so many inquiries as gasoline. These are so varied in their nature and cover such a wide range, that *Motor Age* believes gasoline is a live topic at this time, notwithstanding the numerous articles that have appeared in various publications concerning it.

Believing this to be true, *Motor Age* has undertaken a thorough and exhaustive research, covering every phase of the gasoline situation, the result of which will be set forth in a series of articles, this being the first installment.

By Petroleum

It is difficult to approach the subject of gasoline without having to deal with gravity. The first question a motorist asks when he has his tank filled is, What gravity? So we might just as well get this out of our system first as last.

We confess when we began this investigation, gravity was as puzzling to us as it is to the average man who drives a car. We were told by some that gravity was the only test; that high gravity meant high quality, more power and everything else that stood for efficiency; by others, with apparently the same good faith, that gravity did not mean anything, that high-gravity gasoline might be good or it might be poor, and the same might be true of low-gravity gasoline. So we made up our minds to get at the bottom of this gravity question before we did anything else. It is not so baffling, after all, if we take it step by step. Let's do this.

Two Scales in Use

In the first place, you will have to rid your mind of all the ideas you formerly had on this subject, so as to approach it without any bias. This is what we had to do, and it was the hardest part of our task. Now, the next step is to find out what gravity is.

Gravity simply means weight. There are two scales in common use, specific and Beaume. These scales simply tell us the relative weight of a liquid compared with water. In the specific gravity scale water is taken as a standard at 1. Any liquid which weighs more than water will be expressed by 1, plus additional decimals, thus: 1.5260 is the weight of chloroform, which is about 52 per cent heavier than water.

All liquid products of petroleum are lighter than water; some of them approach more nearly the weight of water than others. They will all be expressed in decimals that indicate their weight is less than 1, thus: .8764 means that the liquid is 8764 the weight of water. Con-

10000

sequently, the higher the numerals or the

more nearly it approaches 1, the heavier is the liquid, and vice versa. Now, bear in mind this refers **only** to the specific gravity scale.

The Beaume scale is entirely different, and this is the scale that is used exclusively in this country commercially, because it is more convenient. In the Beaume scale decimals are not used. Water is taken at an arbitrary point on this scale, being 10. A liquid weighing less than water is expressed by figures higher than 10. Inasmuch as in each scale water is taken as a standard, given the gravity of a liquid as expressed in either table, the corresponding gravity in the other table can be ascertained. This is more clearly set forth in the December 8, 1910, issue of *Motor Age*, page 25.

The Beaume Scale

In this article we shall make use of the Beaume scale exclusively. It will be seen that a liquid that is 50 degrees Beaume is lighter than water, but heavier than a liquid that is 70 degrees Beaume; in other words, the higher the numerals, the lighter is the liquid—the lower the numerals, the heavier the liquid. Now we have a starting point.

When we buy a gallon of 70 gravity gasoline we know that we get fewer pounds than when we purchase a gallon of 60 gravity gasoline, and as we always buy by the gallon and not by the pound, it would seem we get more for our money by buying the lower gravity gasoline, but as this will be treated more fully in a subsequent article, we will pass this for the time being.

The thing that puzzled us most about gravity was the fact that it never seemed to *stay put*. It was like the heathen Chinese—peculiar. When we tested it in one section of the country we obtained a different result from that secured in another section. For instance: working with gasoline in the Atlantic coast states, we reached the conclusion that we must have a gasoline of about 66 gravity. When we got lower than this, we found difficulty in starting a car, and when we got a higher-test gasoline, we did not get the power, and so if we had stopped here, we would have unhesitatingly said, "Use gasoline as near 66 gravity as you can get."

Crudes All Differ

But, to our surprise, when we got into Ohio and experimented with gasoline made from the Lima crude, we found that 62 gravity gasoline gave the best results. Working further west with gasoline made from Kansas and Oklahoma crude, another surprise met us—58 to 60 gravity

gasoline showed up best in every test. We were not so much surprised after this to find that gasoline made from Texas and California crude proved most satisfactory at about 56 gravity. But we must confess that we were surprised when we tested a gasoline that was purported to be made from Borneo crude which had a gravity of 42 degrees. This gave excellent results.

What did all this mean? It seemed to tell plainly and unmistakably that gravity was not a true standard. Certainly it was no standard at all, unless, coupled with it, the field was given from which the crude was produced from which the gasoline was made. It established the fact that the gravity of gasoline was always heavier or lighter, corresponding to the crude from which it was produced. For instance: the gravity of Pennsylvania crude was just 8 degrees lighter than Kansas and Oklahoma crude, and there was exactly 8 degrees difference in the gravity of the two gasolines. Naturally you ask then, Why all this conflict of opinion? and the answer is easy. Each section produces gasoline of a different gravity. You can't expect a man from Florida to boost California grapefruit.

AUSTRIA'S FOREIGN BUSINESS

Vienna, Oct. 18—During 1910 Austria's motor car business has considerably increased as compared with previous years, especially from the import side. The total value of cars, parts and motor cycles imported totals \$5,466,428 for 1910, while in 1909 this total only was \$3,674,151 and \$3,076,292 in 1908. The exportation of Austrian cars, parts and accessories also is on the increase, but in comparison with the imports' big growth it is not very encouraging. Last year shows a grand total of \$1,278,644 worth for the export business, as compared with \$1,175,531 in 1909 and \$840,761 in 1908.

The government's reports show that last year 1,269 motor cars of all sorts were imported, while in 1909 only 742 were brought in, and in 1908 only 649. Of these totals there were 1,204 passenger or pleasure vehicles imported last year, the value being \$3,177,211, or an average value of \$2,638 per car. In 1909 653 passenger cars, of a total value of \$1,915,814, or an average value of \$2,934 per car, were imported. In 1908 the 575 pleasure cars imported were valued at \$1,584,762, or \$2,756 per car.

Parts and accessories to the value of \$2,006,502, including \$1,655,830 worth of tires, were brought into Austria last year. In 1909 this department showed up with a total valuation of \$1,410,169, of which \$1,160,185 was for tires. In 1908 out of a total value of \$1,269,460 for parts and accessories, imported tires came in for \$1,058,746. The tires are bought principally in Germany and France, also in Italy, Belgium and Great Britain. The other parts and accessories come specially from Ger-

many, then from Switzerland and France.

The bulk of the cars which are imported by Austria come from Germany. Last year 597 came from there, or 253 more than in 1909. From France there were received 248, or ninety more than the preceding year. The importations from Switzerland, which were only thirteen cars in 1909, show up with 173 cars last year. From Italy there were imported ninety-five cars, or only eight more than in 1909. The Belgians sold twenty-six cars to Austria last year, or eighteen more than the year before. The imports from Great Britain passed from eight to twenty-one, while those from the United States, which were of six cars in 1909, reached thirteen last year.

The importation of industrial or commercial vehicles shows a drop of twenty-five as compared with 1909, when eighty-nine such vehicles were imported, and nine fewer than in 1908.

Last year the Austrian manufacturers exported all told 282 cars, or twenty-two fewer than in 1909 but forty-four more than in 1908. There were exported 251 pleasure vehicles of a total value of \$787,315, or an average price of \$3,136 per car. In 1909 there were exported 236 such cars of a total value of \$721,771, or an average price of \$3,058 each, while in 1908 the 207 exported cars were worth \$553,688, or an average of \$2,674 each.

The exportation of industrial vehicles decreased nearly 50 per cent last year; only thirty-one vehicles were sent out of the country as against sixty-eight in 1909 and thirty-four in 1908.

Parts and accessories of a total value of \$362,259 were exported last year, which shows a healthy increase, the total for 1909 having been \$275,355 and that for 1908 \$153,413. The cars exported by the Austrian manufacturers go principally to Germany, thence to Russia, Italy, France, Egypt and the Balkan states.

CLAIMS ALABAMA LAW IS WEAK

Montgomery, Ala., Oct. 26—The new motor law of Alabama will be attacked. The allegation is that the law is unconstitutional and the state may be forced to return the license fees collected from the owners of cars. In the act there is a provision that the fee or license collected shall be in lieu of all other privileges which may be exacted by any municipality or county, and the allegation is that this is in direct conflict with the constitution of Alabama. As the law now is, the license fee is paid over to the state and a municipality or county cannot impose a tax or license, but the state divides up with the different municipalities and counties. The flaw was picked out by R. G. Arrington, an attorney of Montgomery. It is probable that steps will be taken at once that will place the case before the supreme court so that a decision can be rendered before time to collect the tax for next year.

The Motorists' Bookman

Electrical Handbook

AS one of a series of installation manuals for electricians, by the same author, S. Kenneth Broadfoot has written a handbook entitled "Motors, Secondary Batteries, Measuring Instruments and Switch-gear." The title is almost too big for the book, a little pocket-size edition of some 90 pages.

In view of the fact that it is intended as working manual for the use of installers and operators of electrical apparatus rather than as reference work, the book fulfills its purpose admirably. But intelligent use of it would seem to presuppose a previous thorough knowledge of the fundamentals of the subject on the part of the reader, in addition to some practice in the use of trigonometric functions.

The work is divided into four chapters, in which are discussed in order the measurement of electric currents and the instruments employed in such measurements, the care and operation of motors, starters, switches and other switchboard apparatus, and finally the care and operation of storage batteries. It is published by Butler and Tanner, London.

The Flight of Birds

One work for which the science of aviation has to thank the Aeronautical Society of Great Britain is the compilation and reprinting of the more authoritative of the early treatises upon the subject. These have been published as a series under the caption of "Aeronautical Classics." No. 6 of this series is a translation of the portion of Borelli's "De Motu Animalium," which concerns the flight of birds, the original of which appeared in 1680.

The history of the 17th century is particularly remarkable for the rise of scientific learning. This period bristles with erudite men, who with immense industry gathered up all the scientific lore of the ancient world, rewrote it and then boldly set out on the wide basis their labors had founded to build up all the branches of human learning. Not the least among these was Giovanni Borelli, a native of Naples. The publication of his "De Motu Animalium" raised a vast storm of discussion among the learned throughout Europe.

The section called "De Volatu," which is translated for the first time into English by the Aeronautical Society of Great Britain, is an original study, as Da Vinci's earlier work lay undiscovered until the end of the 19th century. Substantially "De Volatu" is remarkably sound, and knowledge of it is an essential preliminary to any study of the flight of the birds. Borelli's doctrines remained unquestioned for nearly two centuries in spite of one or two errors that have been shown up by the advances in the science that have oc-

curred since his time. The most notable error is Borelli's overestimate of the power exerted by birds to maintain flight in his attempt to deduce it from the ratio between the weight of their muscles and their total weight. The naive deduction that "it is impossible that men should be able to fly craftily by their own strength" would have saved many costly experiments by early investigators had it been heeded. Published for the Aeronautical Society of Great Britain by King, Sell & Olding, Ltd., London.

Iron Founders' Handbook

A manual that will be valuable to the metal working trade is the "Handbook for Iron Founders," issued by the Frodair Iron and Steel Co., Ltd., of London. The book takes up in order the different elements in pig iron, the effects of the different chemical constituents and impurities, the selection of irons for special castings, hints on cupola practice, areas of pouring gates, the arrangement and regulation of the cupola blast, and an article on the judging of temperature of molten iron by the temperature.

There is appended a series of the usual tables, thermometer scales, metric equivalents, etc., with blanks for memoranda of iron analyses. The work is bound in flexible leather and printed on very thin paper so that the 150 pages do not take up much space in the pocket.

Canadian Touring

"Through the Heart of Canada" is a series of short historical and descriptive sketches of the dominion of Canada, its leading cities, and its people. In this volume of 320 pages the author, Frank Yeigh, takes the reader from "Down Nova Scotia Way" across the dominion to the southern coast of British Columbia.

"There are two Canadas in one within the boundary lines of the dominion; the golden west and the silver east—the golden west, with its wealth of grain lands and ranges of mineralized mountains, its forested valleys and fish-stocked streams; the silver east—the ancient Canada—made up of the provinces by the sea, whose silver shores are lapped by the Atlantic tides and whose cliffs face the older world of Europe whence came the first pathfinders."

The scope of the book may be obtained from some of the chapter titles: New Brunswick and its neighborhood; Quebec, the citadel of the St. Lawrence; Montreal, Ontario, across Canada's 1,000-mile farm, the land of the rancher, mountains and mountain climbing, southern British Columbia: its coast and cities. There are many illustrations featuring parliament buildings, typical mountain scenery, etc., which add to the interest and value of the work. Published by A. C. McClurg & Co.



HORSESHOE CURVE AS SEEN ON GROVE'S EXCLUSIVE ROAD FOR MOTOR CARS

**REST
and
TALKING**

AN exclusive motor car road, nearly all of which is 3 to 5 per cent grade, beginning at the foot of Sunset mountain, near the end of Charlotte street, Asheville, N. C., and winding around the face of the mountain to its summit, has just been opened to the public by Dr. E. W. Grove, of Asheville and St. Louis.

The entire length of the road to its summit has been laid with macadam and rolled until its surface is as smooth as a floor. The road is of sufficient width for speeding motors to pass at any point. There are signs at approaches to all curves to "blow horn," while at the entrances to this road and at its intersection with the carriage road that also leads to the summit, are signs giving notice that carriages are not allowed on this road, while the carriage road over a different course has signs to the effect that motor cars are not permitted on it.

The distance from the center of the city to the summit of Sunset mountain over this road is 5 miles, and motoring over its smooth surface presents to the eye views of rare sublimity and grandeur. At each turn of the road, all along the mountain-side, are delightful vistas that stretch away to the north and west, glimpsing the beautiful valley of the French Broad river, whose Indian name is Tahkeestee, meaning racing river, with Asheville in the foreground. The consummation of the tourists' enjoyment is attained when the summit of the mountain is reached. Here, at an altitude of 3,119 feet above the sea level, and nearly 1,000 feet above the city, in full view across the Asheville plateau, there is a world of grandeur and a loveliness of setting that stretches away to the far-off mountains in the west, where the

Road for Motor Cars

majestic peaks of Pisgah, Richland Balsam, Cold mountain and the Bald pierce the sky.

This motor road connects at the summit of Sunset with the crest of the Blue Ridge highway, which is to extend from Asheville to Blowing Rock, along the crest of the mountains, at elevations ranging from 3,100 to 6,500 feet above the sea level, and passing within a few hundred feet of the top of Mount Mitchell. More than 50 miles of this highway has been completed from the Blowing Rock end, while a horse-back trail from Sunset to Mount Mitchell has already been opened up along the site of the highway.

A WESTERN MOTOR TOUR

Sprague, Wash.—Editor Motor Age—We left Sprague one afternoon and spent the night at Washtucna, and upon leaving there the next morning we were told of the steep and sandy grades around the Snake river, but with faith in our Maxwell 30 to make good, we slowly made the ascent without trouble.

From Lyon's ferry to Walla Walla was one of our worst days; the dust was very bad, with heavy wind blowing, so that at times we could hardly see the road; but our troubles were all forgotten upon reaching the pretty little town of Walla Walla, where we stayed over night and took in the sights. Leaving Walla Walla, we passed through Milton and Athena, en-route to Pendleton, Ore. Five miles on the other side of Pendleton we met with our first and only bad luck outside of tire trouble. As we were backing into a camping place we found that the engine

would run but would not turn the wheels. Our location was ideal for a day's rest, as the girls could fish as I worked on the car. Finding the rear axle was broken, I hired a team from a rancher and drove back to Pendleton, where it was soon replaced with a new one.

From Pendleton we took what is known as the Ridge road, which is very good except for the long grades. We passed through Heppner, Lexington, Ione and Olex, following Rock Creek 18 miles. This country is more or less rough, with some heavy pulls through sandbars. After crossing the John Dey river by ferry, we encountered a very steep and sandy hill, which is known as the John Dey. This hill stands out strongly in every motor enthusiast's memory after he has once made the climb. The ferryman advised us not to take chances, but to hire a team to pull us up, as a driver lost control of his car the week previous and it backed off the grade. In spite of past history we negotiated the hill without trouble. From the Dalles, Ore., we shipped by boat to Portland, landing there in an Oregon mist. From Portland to Eugene, Ore., through the Willamette valley, we had comparatively level roads. From the town of Comstock to Drain, through the Pass Creek canyon, we encountered one of the roughest roads on the whole trip. It was not so steep, but full of chuck holes. In fact, the road was bottomless, owing to a rain a few days previous, and it was nothing uncommon to meet and pass a stranded machine.

The next day was spent in the mountains of Oregon, which are extremely rugged in places, especially in the Cow Creek canyon. There we had one continual

INFORMATION



INTERSECTION OF CARRIAGE AND MOTOR CAR ROAD AT SUNSET MOUNTAIN, ASHEVILLE, N. C.

climb for 9 miles, with places so steep that it seemed impossible for a car to make them. We forded Cow creek this side of Glendale, then continued our climb over Wolf creek, Grave mountains and then Jump Off Junction, which tells more than is possible to describe. In continuous mountain climbing it is essential to carry water to cool off the engine, as much more power is developed with a cool engine. The road through Grant's pass and Rogue river to Ashland was like traveling on a pavement compared to the rough mountain roads. From Sprague to Ashland, Ore., we used 52 gallons of gasoline.

Some 6 or 7 miles after leaving Ashland we came to the toll road over the Siskiyou mountains. Here we made a raise of over 1,000 feet in a little less than a mile, which gives some idea of what the grades really are. While they are very steep, the roads are well kept and hard, except at the railroad crossing at the little station of Siskiyou, where there is a fresh fill of gravel and sand. Knowing all cars have trouble there, the station agent ran out with his camera to take our picture. He anticipated that we would have to use ropes and pulley as some cars do, but was disappointed, so took a snapshot while the car was in motion. The top of this mountain has an elevation of about 4,000 feet.

From Dunsmuir, Cal., to Redding most of the touring cars are shipped to avoid the Shasta mountain, but we were out for the adventure and time was no object, so we decided that if teams could make it we could. In one place in order to avoid a big rock in the center of the road we had to use a shovel and build a road around it. The Shasta mountains are steeper and more rugged than those in Oregon, with

Climbs Mountain Pass

the roads so narrow that in places the slightest mistake on the part of the driver would send car and occupants over the edge of the steep precipice; in some places the road circles back and forth several times with sharp and dangerous turns. A five-passenger car can make the turns, but larger cars are compelled to stop and back up.

My wife and daughters say that the scenery was very beautiful through these mountains, with the snow-covered peak in the distance, but I cannot corroborate the statement, as my scenery consisted of narrow roads and sharp turns.

From Redding by way of Tamaha and Woodland, through the Sacramento valley, we had excellent roads to Vallejo. We spent one day there at the United States navy yards on Mare island, where we were treated royally to a dinner on the United States supply ship. We ferried across the bay to San Francisco and spent a few days there. After leaving San Francisco we spent most of our time in side trips, visiting most of the summer resorts around Los Angeles.—D. H. Mills.

BETTER THAN NATIONAL PIKE

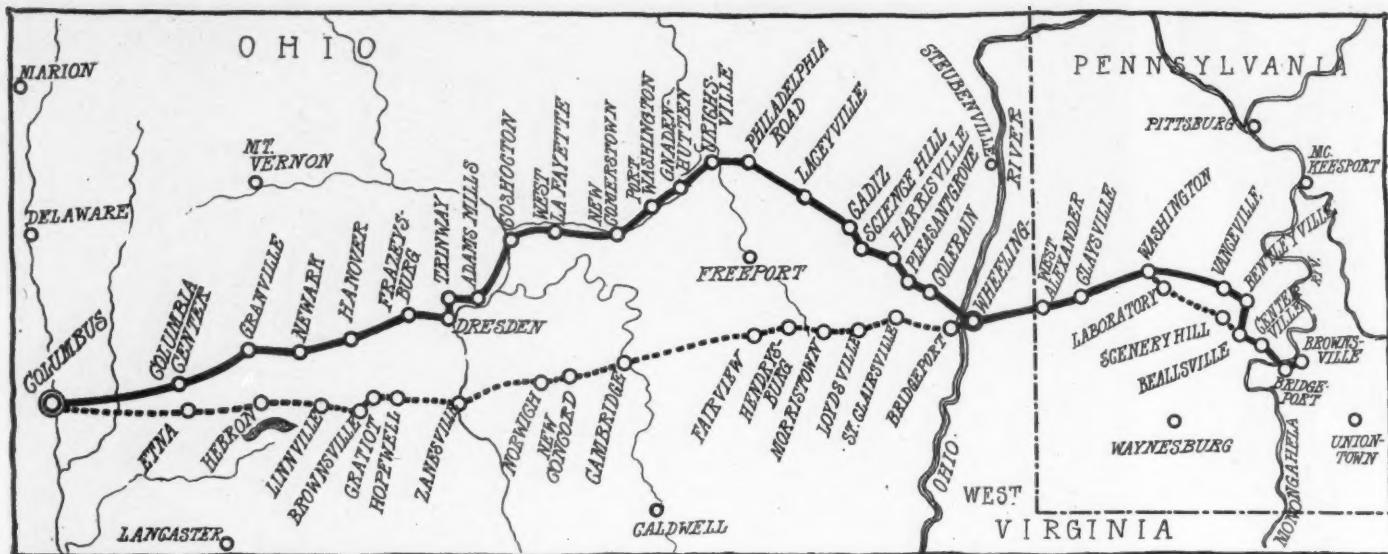
Brownsville, Pa.—Editor Motor Age—There is a route from here to Columbus, O., which few tourists know of, and it far exceeds the old national pike, though a few miles longer. Having traveled this route many times in the past 5 years, I can speak for its advantages over the pike.

The route as outlined is from this point west, as we are located on the line of the pike where it crosses the Monongahela river. Referring to the difference in the

conditions of these two routes by following the old pike road, there is but little level going until within 30 miles of Columbus; while the other route meets the Panhandle main line at Philadelphia Roads, about 109 miles from Columbus and follows it nearly the entire distance, partly along the old Ohio canal, which naturally avoids all grades. There is only some 30 miles of clay roads on this route the rest being stone and gravel. The 209 miles can be driven in 10 hours with ease for both car and traveler, which cannot be said of the pike route. There is an entire absence of toll gates and the surface is better in all ways than the old worn-out pike. The pike is followed from the start to Wheeling, W. Va., but of this 56 miles there are 26 miles of good road if the pike is followed direct, but in good weather a better route is given which goes north of the pike to Washington, Pa., and is 3 miles longer. The last 15 miles into Columbus is a fine stone road, so, in all, the trip is a pleasure compared to the hard one over the pike. The itinerary is as follows:

Miles.

- 0—Brownsville. Cross ferry over Monongahela river; turn left on brick street $\frac{1}{4}$ mile, right fork up hill, direct to
- 6—Centerville. Direct through town to
- 9—Beallsville. Direct on old pike or turn right on state road to
- 12—Bentleysville. Cross railroad, turn left up hill, along ridge road to
- 17—Vanceville. To fork, turn left to
- 22—Church. Pass church, turn left through covered bridge direct, turn right to
- 28—Washington. East Beau street, direct to main street, turn right to Chestnut street, turn left direct through West Washington on pike to
- 37—Claysville. Direct to
- 44—West Alexander. Direct through town, right fork down hill, under railroad, to West Virginia state line. Level, good road to
- 60—Wheeling. To Market street, to market house; turn right across bridge—5 cents toll—to island; turn right to second bridge—5 cents toll—turn right 50 yards; turn left up hill 3 miles.



READER SUGGESTS BETTER ROAD BETWEEN BROWNSVILLE, PA., AND COLUMBUS, O.

- 67—Colerain. Direct to Pleasant Grove to
74—Harrisville. Direct, 1 mile to south turn, water though, to
79—Science Hill. Through town, turn right, direct, long hill, bad breakers.
83—Cadiz. Direct on main street to state road to
95—Laceyville. Direct 4 miles to Panhandle railroad, to Philadelphia roads to
102—Dennison.
103—Uhrichsville. Cross bridge to brick street, turn left 1 block, turn right and direct to
113—Gnadenhuten. Direct to Port Washington on gravel roads to
126—Newcomerstown. Leaving town to right, West LaFayette to
141—Coshocton. One block on brick street; take left fork at fountain to railroad crossing; turn left to Star hotel, turn right 3 blocks to river road; at 2 miles cross bridge over river and canal direct to
153—Adam's Mills. Along canal to Trinway and Dresden, or at 50 yards turn left across railroad; one mile turn right and follow wires to
158—Dresden. Cross bridge, 1 block turn right, 1 block turn right, and direct under railroad tracks, direct 4 miles to covered bridge, cross and direct to
164—Fazeysburg. Main street to railroad crossing; before crossing turn right and direct to covered bridge, cross and turn left and direct to
172—Hanover. Turn left and direct to
180—Newark. Pass public square to second street, turn right to church. Take Granville avenue to
186—Granville. At Third street pass public square, turn left and direct to
209—Columbus.

A. C. Smith.

REQUEST FOR ROUTE TO MOBILE

Milford, Ind.—Editor Motor Age—I am contemplating a trip with my family from this place to Citronelle, Ala., the latter part of November, returning in December. We have thought of going one route and returning another, so as to see more country, if two good routes are available. From what I have already seen in Motor Age of southern routes, I presume one route would be via Indianapolis, Louisville, Nashville, etc. If the road is better we would also go via Atlanta. While in Alabama we will also visit other points, such as Mobile, Deer Park, Fruitdale, Mt. Vernon, etc. If a good route is offered through Mississippi we will return that way, and sidetrack a day or two to Hattiesburg, Miss., but this is not a necessary part of our plans. We have been advised against starting on this trip at this time of the year. If

either the season or the condition of the roads are apt to be quite bad, we will not start out.—L. M. Neher.

Many motorists say the fall is the only time in which to tour to really enjoy it. They claim the dusty country roads and hot weather take the pleasure out of the surrounding beauties. At any rate, the fall is the best time of the year for southern touring, but, as you know, there have been very heavy rains and naturally the roads will show it.

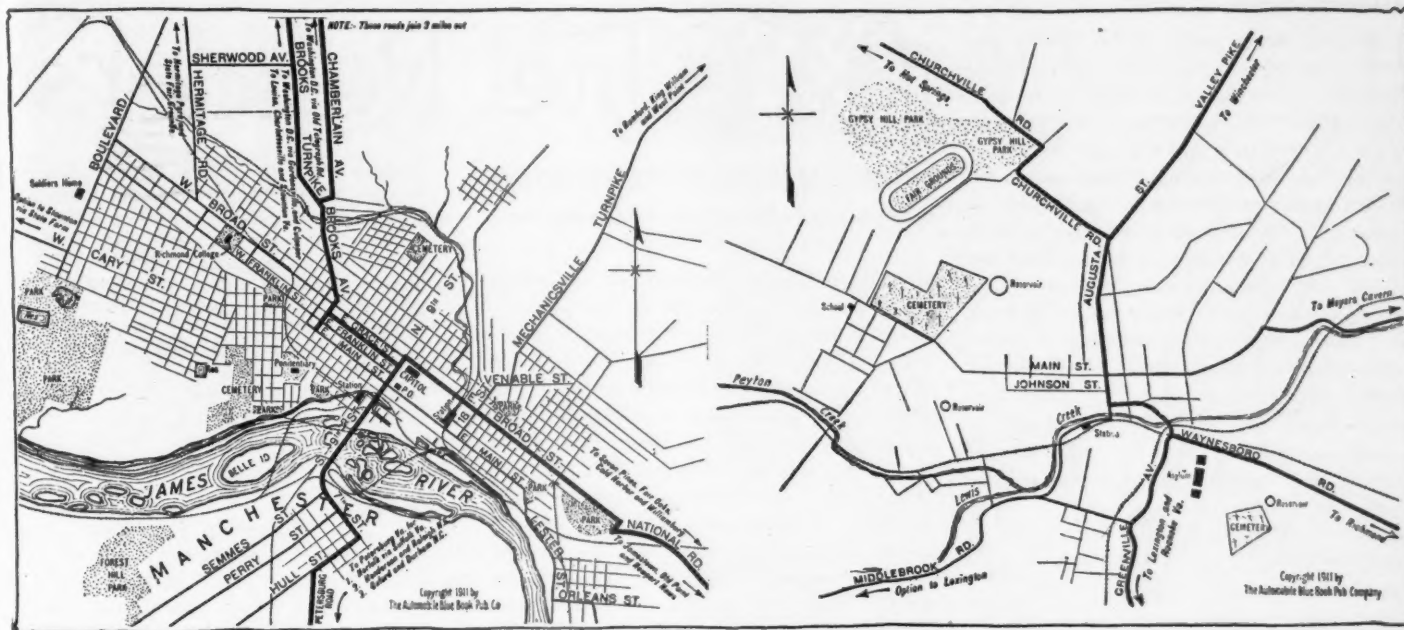
Motor to Warsaw, Argos, Rochester, Fulton, Matea, Logansport, Deer Creek, Carroll, Darwin, Burlington, Middlefork, Michigantown, Boyleston, Kirlin, Lafayette, Rosston, Augusta, Indianapolis, Seymour, Uniontown, Caruthersville, Scottsburg, Vienna, Underwood, Henryville, Memphis, Sellersburg, New Albany and Louisville. There are mostly good gravel or stone roads to Louisville, with a few stretches of dirt south of Seymour.

Through Kentucky to Nashville the routing is Mount Washington, Bardstown, New Haven, Athertonville, Buffalo, Cammer, Bear Wallow, Cave City, Mammoth Cave, Glasgow Junction, Bowling Green, White House, Goodlettsville and Nashville. Nashville to Montgomery lies through Murfreesboro, Shelbyville, Fayetteville, Meridianville, Huntsville, New Hope, Fort Deposit, ferry across the river to Gunter'sville, Brooksville, Oneonto, Village Springs and Birmingham, Monte Valor, Clinton, Verbena, Wetumpka and Montgomery. In case there is a rainy spell it would be advisable to inquire at Verbena as to the condition of the roads to Montgomery, and if muddy first motor to Deitsville.

Montgomery to Mobile is through Colquett, Liberty, Fort Deposit, Greenville, Evergreen, Brewton, Flomaton and Mobile. Citronelle is about 35 miles north-west of Mobile.



GROVE'S ROAD LEADING TO SUMMIT OF SUNSET MOUNTAIN, ASHVILLE, N. C.



MAIN STREETS OF RICHMOND, VA.

BEST MOTOR ROADS OF STAUNTON, VA.

If you want to take in Atlanta motor from Nashville to Murfreesboro, Holly, Manchester, Hillsboro, Pelham, Montecagle, Tracy City, Jasper, Chattanooga, Lafayette, Summerville, Rome, Kingston, Cartersville, Ackworth, Kennesaw, Marietta and Atlanta. Atlanta to Montgomery is through College Point, Red Oak, Monks, Union City, Palmetto, McCollon, Madras, Newnan, Moreland, St. Charles, Grantville, Hogansville, LaGrange, Langdale, Riverview, Beulah, Opelika, Auburn, Tuskegee, Mt. Meigs and Montgomery.

You can return to Nashville by a different route through New Orleans, La.; Jackson, Miss. and Memphis, Tenn., by routing through Pascagoula, West Pascagoula, Ocean Springs, Mississippi City,

Biloxi, Gulfport, Pass Christian, Poplarville, Cameron's Ferry, Bagalusa, Covington, Madisonville, Ponchatoula, Hammond, Amite City, Dennis Mill, Magnolia P. O., Baton Rouge, Fort Allen, Plaquemine, Donaldsonville, Edgard, Hahnville, Westwego and New Orleans. A route along the east side of the Mississippi to Baton Rouge is Kenner, La Place, Darrow, Baton Rouge, thence Greensburg, Osyka, Johnston, Norfield, Brookhaven, Beauregard, Hazlehurst, Crystal Springs, Terry, Jackson, Tougaloo, Ridgeland, Madison, Gluckstadt, Canton, Pickens, Goodman, Franklin, Lexington, Greenwood, Schlater, Black Bayou, Glendora, Whitehead, Sumner, Tutwiler, Clarksdale, Cloverhill, Coahoma, Rich, Dundee, Clay-

ton, Tunica, Hollywood, Robinsonville. Clacks, Lake Cormorant, Glover, Lynchburg, Memphis, Aulon, Whites, Germantown, Booth, Forest Hill, Bailey, Collier, Piperton, Rossville, Moscow, La Grange, Grand Junction, Saulsbury, Rogers Springs, Essary Springs, Corinth, Burnsville, Iuka, Cherokee, Barton, Tuscombia, Shemeld, Florence, St. Florian. Green Hill, Loretto, Pleasant Point, Leoma, Dunn, Lawrenceburg, Summer-town, Crestview, Williamsville, Sandy Hook, Mt. Pleasant, Ridley, Columbia. Neapolis, Brentwood and Nashville.

The experiences through Mississippi and Louisiana are somewhat severe, but it is a trip that will never be forgotten. Many miles can be saved over this route by taking the journey in dry weather. Arrangements have to be made in advance with Goithers & Son to be ferried over the Pascagoula bay to West Pascagoula. You will find the 22 miles between Biloxi and Pass Christian especially beautiful over a fine shell road along the gulf. You can go direct from Bagalusa to Amite City and shorten that stretch considerable, or at Covington you can cross the Lake Pontchartrain by boat to New Orleans and save 228 miles.

LOVELAND, COLO. INQUIRY

Bern, Kan.—Editor Motor Age—Through the Routes and Touring information department will Motor Age give me the best route from Bern, Kan., to Loveland, Colo.—R. E. Wright.

Motor to Oneida, Seneca, Baileyville, Axtell, Beattie, Marysville, Washington, Belleville, Mankato, Smith Center, Philipsburg, Almena, Norton, Clayton, Jennings, Colby, Goodland, Burlington, Limon, Deertail, Strasburg, Bennett and Denver, thence to Longmont and Berthoud to Loveland. On account of the very heavy rains Mr. Dods of the Blue Book has advised the above routing.

Touring Club of America Road Information

CHICAGO TO DENVER

THE route between Chicago and Galesburg is exactly the same as published in the 1911 edition, volume 4, of the Automobile Blue Book. This is the best way between these two towns and is a good road in almost any condition of weather.

GALESBURG TO BURLINGTON—In order to avoid some very bad sand southwest of Galesburg, the best route goes due west to Aquaka, crossing the river on a ferry, charge \$1. For a short distance after crossing the river you run through the bottoms and then up on the ridge. The road is very good from there to Burlington.

BURLINGTON TO FT. MADISON—The road is marked by telegraph poles and is a good road except after exceedingly heavy rains. One may strike the Waubonsie trail at Fort Madison going direct to Donnellson, but the poles are marked between Fort Madison and Keokuk.

From Keokuk take the Waubonsie trail, all poles being marked black and white, from there to Donnellson swinging due west of Donnellson straight across the southern tier of counties in the state of Iowa, through Centerville, Clarinda and Shenandoah for 5 miles just east of Nebraska City in the state of Missouri, then straight into Nebraska City. This route practically comprises the whole of the Waubonsie trail. Practically the only places where there are accommodations, however, are the towns mentioned with the exception possibly of Mount Airy.

NEBRASKA CITY TO LINCOLN—Follow a supplement of the Waubonsie trail which, at present, is not marked out on the poles, but will be in the near future. At Lincoln we strike the Omaha-Denver transcontinental route; these poles are also marked black and white and the road from Lincoln to Holdrege

through Hastings is all that a dirt road can possibly be, being properly dragged and kept up in the best of condition.

From Holdrege west the road is a little rough for a short distance, the heavy rains this year having played havoc with the work that had been done, but people are so interested in this route that they will again put this road in the best of condition.

At Arapahoe it was necessary for the Touring Club car to go up and over a railroad bridge because of a very heavy rain north of there which made a river between a quarter to 1-2 mile wide and about 6 feet deep where the road ought to be. In the neighborhood of Cambridge the road is very rough, due to the exceedingly heavy rains, which washed out about 1,000 feet of the Burlington railroad, but the work of putting this road back in good condition was started immediately after the washout.

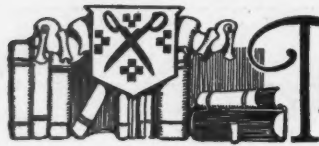
CAMBRIDGE TO IMPERIAL—This is through an arid country, but the road is fair and should be passable except in the wettest of weather. We cross the line into Colorado just before getting into Holyoke and immediately one notices the better condition of the road. The soil in Colorado has just enough sand in it so that it is not bad in wet weather and enough dirt in it so that it does not become heavy in dry weather.

From Holyoke to Sterling, Fort Morgan, Bennett and into Denver one could not ask for a better road. The dry-creek fords where formerly the teams and motor cars had so much trouble getting through the sand have all been fixed with concrete at quite a little expense and there are now in process of construction several concrete bridges which will make this road even better. One must bear in mind on leaving Fort Morgan that it is approximately 70 miles to the next town and should make a point to see that his gasoline is more than sufficient to make that distance.

AGAINST INNER SLEEVES

HARTFORD, Conn.—Editor Motor Age—Having seen several letters in your last two or three issues in reference to "Puncture-Proof Inner Shoes or Protectors," the writer would take the liberty of telling you what his experience has been in the past in connection with the use of these. On reading the last letter in your paper, would say the information given by the writer does not seem to be based on what the trouble really was, but what it would be, and, furthermore, he does not state that he has used the tubes or protectors.

The experience which I give you is based on the use for 3,000 miles of the inner tube protector, or non-puncture protector. This is made up of a series of layers of canvas with steel disks in between every layer, which makes same practically non-puncturable. In the first place, this protector, according to the device of manufacture, should be cemented with vulcanized cement into the casing, which is a very mean job in itself. In the second place, all the inner tubes have to be shortened one inch in circumference. This is another mean undertaking. In using these, the writer has found the inner shoes absolutely non-puncturable, but in a mileage of over 3,000, with a full set of four on one car, the writer had two blowouts, which were not on the inner rim, but around on the side, which demonstrated the fact that they do not prevent blow-outs to hardly any extent. After a tire goes flat for any reason, and the car runs about 10 or 15 feet on the flat tire, the inner shoe becomes loosened from the casing, and before a new tube can be used, this inner shoe has to be cemented in again, which is really impossible on the roadside; therefore, making it necessary to change your casing after the inner tube goes down. It has happened three different times that the excessive heat of traveling long distances at a high speed has loosened up the inner shoe free from the casing, so that same



The Readers' TIRE LINERS IN QUESTION

Differing Opinions of Users as to Value of Inner Sleeves

slipped around in the casing and sheared off the air valve from the inner tube.

The above is an exact statement of results or luck I have had with these inner shoes, and, after summing it all up in regard to the price paid for the shoes and the results obtained, the writer is positive that they are not worth the trouble of installation. In fact, the writer thinks so little of them that he has a full set in his garage at the present time that he is not using at all and does not think it worth while to insert in other shoes. Hoping the above information will tend to keep more motor car owners on the right track, I remain—George W. Hayden.

FAVORS TIRE LINERS

Marion, Kan.—Editor Motor Age—I read with much interest the article on inner liners by A. D. Carpenter in the October 5 issue of Motor Age, as the experience was in such marked contrast to that of the writer's. I note that he is inclined to judge all inner liners by the one-ply cotton article which he was inveigled into buying, and through which he states he could stick a common pin easily with his fingers. I admit that most tire protectors are overrated by their enthusiastic makers, but this evidently does not operate against all of them, for I am using a pair of inner liners which are surely as satisfactory as Mr. Carpenter's were unsatisfactory.

These are made of five-ply fabric, and are vulcanized into tire shape. They did not come to me nicely rolled up in a package, but had to be packed for shipping like tires. These are held securely in place by metal clips, which engage the troubles. I washed out the tire with

The Readers'

EDITOR'S NOTE—To the Readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department. It has been discovered that the proper signature has not been given on many communications, and Motor Age will not publish such communications, and will take steps to hunt down the offenders of this rule if it is violated

bead of the casing on one side with fabric flaps opposite each clip, which also grips the bead of the casing firmly, making a continuous band crosswise. This mode of attachment takes much of the strain from the outer casing and my theory is, after considerable experience with them, that it adds 50 per cent to the life of either a new casing or old. I can depend on their preventing most punctures and all blowouts, and experience has also taught me that where I put a metal hook next to a blowout or rim cut, it will repair that kind of an injury to a tire.

I quite agree with Mr. Carpenter that the tire makers could improve their product remarkably by adding a little strength, but since they seem obdurate in this respect, my only security is in the use of a good inner liner. I can assure Mr. Carpenter that as far as tire protectors are concerned they are not all bad, as he intimates.—John W. Gardner.

OBJECTS TO TIRE LINERS

Geneva, Ill.—Editor Motor Age—For the benefit of the public and the Sauk Center, Minn., writer in Motor Age, issue October 5, I will relate my experiences with the so-called inner liners. I ordered a set of four inner liners and paid a good price. Upon receipt of same I found them to be four-ply canvas cemented together, and I thought I had at last solved my tire

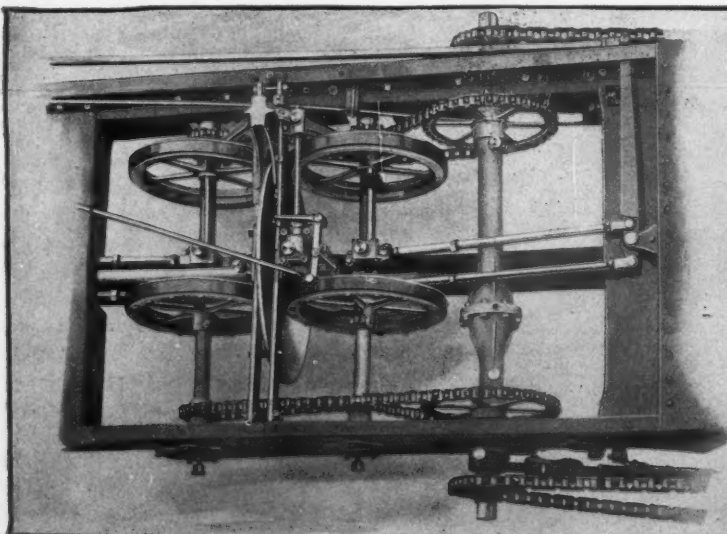


FIG. 1—FRICTION TRANSMISSION OF SEITZ TRUCK

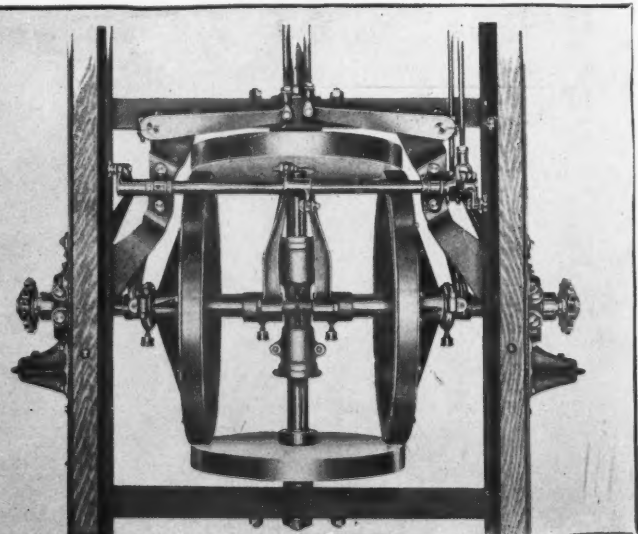


FIG. 2—TRANSMISSION OF UTILITY TRUCK

Clearing House

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired

gasoline, and was very careful in putting them in, also with the tubes. I started out feeling very safe from tire troubles for the rest of the summer, and behold one afternoon, coming from a short ride, I had a tire go down. Upon examining the cause I found the tube cut in two, as though one had taken a knife. Up to this time I had used the inner liners 300 miles. After another 100 miles the above occurred again. I had been running about 25 miles per hour. I stopped to repair it, but the inner tube was so hot one could not hold it. Later I examined the other tubes and found them to be very rotten, caused by the inner liners, as they create so much heat with no chance to escape.—F. P. Glass.

NO WATERPROOFING FOR TOPS

Hannibal, Mo.—Editor Motor Age—Through the Readers' Clearing House will Motor Age tell me what is the best preparation to use on black mohair tops to prevent leaking. The top on my car is comparatively good.—F. G. R.

Motor Age knows of no preparation that will do the work satisfactorily. One of the leading concerns in Chicago manufacturing and repairing motor car tops and bodies claims that it has tried a number of the so-called waterproofing compounds for tops such as yours and found none of them satisfactory. If any of the readers know of a preparation that will answer the purpose Motor Age will appreciate the information.

SOME FACTS FOR MOTORISTS

Minnesota Reader Discusses Motor Fuels and Use of Picric Acid

Marshall, Minn.—Editor Motor Age—The compression chamber of a gasoline motor cylinder is never completely emptied of the products of combustion. The retained gases, held there by back pressure from the muffler, mix with the next supply of fuel vapor, and, there being no oxygen in them, they reduce the explosive energy of the charge. It has been suggested in motor car journals published in London that a puff of air be delivered into the combustion chamber at the time of the exhaust to scavenge the combustion chamber of these inert gases, and replace them with oxygen-bearing air to improve the explosive mixture. If this can be accomplished it should do much toward improving the efficiency of the motor.

Just before the accidental death of a noted car race driver a few weeks ago he was advised to use chemicals to increase the explosive energy of the fuel used in his racer. He was not educated in chemistry sufficiently to appreciate the risks which he was taking, and while we do not know for a certainty that he placed an unreasonable amount of picrate of potash and sulphuric ether in his fuel tank before the fatal try-out, there is good reason to suppose that such is the fact.

Picric acid and its salts are known to chemists as most dangerous and uncontrollable explosive agents, and when dissolved in alcohol or ether and mixed with gasoline they form a mixture which must be gauged with the greatest possible knowledge and foresight to be safe as a fuel for explosive engines.

The revolving valve used to open and close the ports of a combustion motor is not new, but it has not been given the attention which its merits invite. An Italian inventor has devised a revolving valve which also contains

the combustion chamber in such a way that when compression takes place there is a compression chamber, and when the exhaust takes place there is no vacant space above the piston to retain inert gases and weaken the mixture.

Various methods have been in use to increase the rapidity of vaporization, and make it more complete, of gasoline and kerosene in combustion motors. One of the latest as described in a German magazine consists of a small alcohol lamp arranged to heat the intake manifold. The lamp is arranged to withstand wind from the fan, and the flame is covered with wire gauze, similar to the safety lamps used by miners.—A. D. Hard, M. D.

FRICION TRANSMISSION

Kansas City, Mo.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions:

1—Illustrate and explain the present methods of friction transmission, using both shaft and chain final drive.

2—Also give the names of the best materials used on the friction parts, and the approximate length of the life of same, and the approximate amount in loss of power consumed by friction on the several parts in transmission.—P. D. Rouse.

1—The usual form taken by friction drives is the single wheel contacting with another flat-faced one. Since these must be at right angles, the car is nearly always a chain-driven one, the driving wheel being located on the rear end of the crankshaft and the driven shafts across the middle of the car. The variable speed is obtained by sliding the driven disc on the keyed crossshaft across the face of the driver. Two arrangements of this kind are shown in Figs. 3 and 4, and are representative of American practice, particularly in the pleasure car field. These are the transmissions used by two of the leading exponents of friction drive, the Cartecar and the Lambert, both chain-driven cars.

To secure a more certain drive and to obtain the differential action at the same time, conditions more necessary in com-

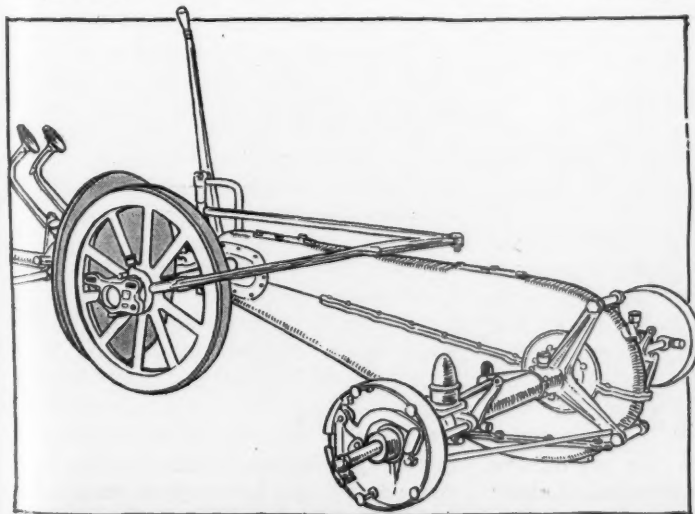


FIG. 3—CARTECAR FRICION DRIVE

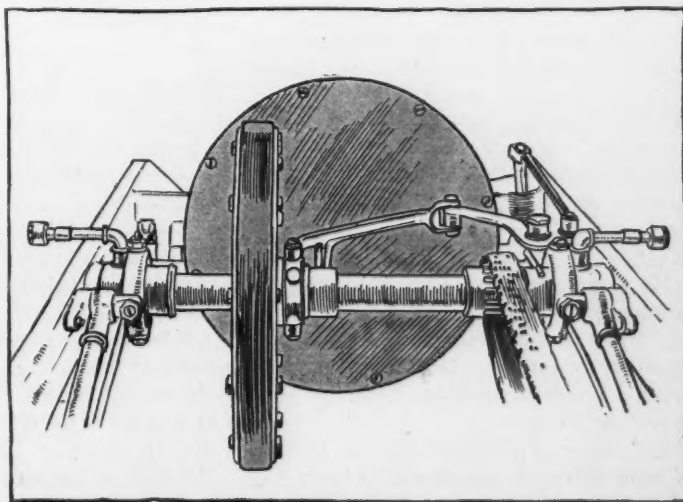


FIG. 4—FRICION WHEELS OF LAMBERT

mercial vehicles, where heavy loads are carried at low speeds, the crossshaft is often fitted with a pair of wheels, contacting on opposite sides of the driver fact and mounted upon independent shafts. This method caused the shafts to turn in opposite directions, and a gear or other means of reversing the direction of motion is necessary in connection with one of them. To take up the wear in the bearings two sets of wheels are often used. Two methods of accomplishing this are shown in Figs. 1 and 2. Fig. 1 is the arrangement used in the Seitz trucks, and Fig. 2 represents the transmission of the Utility truck.

2—The Rockwood Mfg. Co., of Indianapolis, has made a series of tests of materials for friction drive and recommend tarred fiber and aluminum. In general the metallic disk is made the driving member and the friction wheel the driven. The mean slip between the disk and wheel, which may be considered as occurring at the center of their face of contact, varies with the value of the coefficient of friction between them and with the ratio of the width of face of the wheel to the diameter on the disk at which it operates. When this ratio is small, there occurs at points on the face nearest the center of the disk a negative slip, or the driven member travels faster than the driver. Such a condition represents a loss of effective pull, and results, for a given load and pressure, in an increased slip of the driven member.

To guard against such action and reduce slip loss to a minimum, the ratio of the face width of the fiber wheel to the distance at which it operates from the center of the disk should be as great as possible. Experiment shows that for good commercial results it may range from 1 to 6 to 1 to 8. But as the efficiency of disk drives is of marked importance only at the outer positions of the fiber wheel on the disk—where it is most commonly used, and where greatest power is being transmitted—it is sufficient that these ratios hold true only for such positions. Therefore the width of face of the fiber wheel should be made equal to 1-12 to 1-16 the diameter of the disk.

The diameter of the fiber friction wheel relative to that of the disk is not important as regards transmitting capacity. However, as the diameter of the wheel is decreased, its driving torque decreases proportionately; also, the relatively smaller its diameter, the faster it revolves, resulting in a somewhat more rapid wear. When the friction wheel is made larger than the disk, the objection is offered that its face width is relatively small for its diameter, and too great a space of installation is required for the drive. Preferably the diameter of both should be the same.

The value of the coefficient of friction in disk drives is practically independent of the pressure of contact, and, excluding

NOTICE TO READERS

Motor Age has received communications addressed to the Readers' Clearing House from the following named towns and nom de plumes:

Chicago—Subscriber.
Washington, Ia.—A Subscriber.
Shreveport, La.—Reader.
Grafton, Wis.—F. N.
Lawrence, Kans.—A Reader.
New York—Reader

These communications will be held until the proper signatures have been received. All communications written over a nom de plume must bear the writer's signature, otherwise such communication will not be answered. These signatures are wanted as proof of the authenticity of the inquiries.—Editor Motor Age.

positions at the extreme center, independent of the position of the fiber wheel on the disk. Thus the driving torque of the driven wheel varies directly with the pressure of contact, but is independent of relative speed positions. Below are given recommended working values of the coefficient of friction for tarred fibre friction wheels, as generally used in these drives, running in combination with different kinds of commercial disk materials:

Coefficient of friction—working values:
Tarred fiber and cast iron..... .323
Tarred fiber and copper alloy..... .352
Tarred fiber and zinc alloy..... .364
Tarred fiber and aluminum alloy.... .390

It will be seen that the aluminum gives the highest friction with tarred fiber wheels.

ELIMINATE BRIGHT METAL

Anaconda, Mont.—Editor Motor Age—As a motor car owner I am pleased to note that there is an interest being manifested to eliminate the bright brass on cars, it being a source of a good deal of trouble and expense, and nothing looks worse when not properly cared for. The gold, silver and nickel trimmings that used to adorn vehicles and harness has long been discarded and black has taken its place.

In five or six years a bright brass lamp or horn on a car will be a curiosity. Who will be the first large manufacturer to discontinue its use and receive the thanks of all car owners?—A. N. A.

KEROSENE'S EFFECT ON OIL

Waterloo, Ia.—Editor Motor Age—Through the Readers' Clearing House will Motor Age kindly answer the following questions:

1—Give an opinion as to whether or not kerosene will injure the quality of lubricating oil when injected into the cylinder for the elimination and prevention of carbon.

2—Also give some explanation as to the cause of a grinding noise, seemingly in the differential, which occurs on my car only at a speed of 15 miles per hour. It occurs neither above or below this point. Can Motor Age suggest a remedy? I have taken this matter up with the manufac-

turers, also with several of the garage men, and I have thus far been unable to find anybody who can either explain the cause or suggest a remedy.—W. L. Randolph.

1—The use of kerosene as a carbon-remover will injure the quality of the lubricant and there is some question as to the best method of using it. The safest way is to use the kerosene but once or twice a month and then drain all the oil from the crankcase of the motor and refill it with a fresh supply. About a half teacupful then should be introduced into each cylinder, and the motor cranked briskly for a few seconds so that the kerosene will be distributed all over the walls of the combustion and valve chambers. Following this the crankshaft should be turned into a position where all of the pistons are half way or part way down in the cylinders, and another half teacupful of kerosene poured in onto the piston heads. The motor should be left this way over night, during which time the kerosene will seep down past the piston rings thinning out the gummy oil and carbon from around the rings.

This oil being dirty and tending to thin the lubricating oil in the crankcase as well, if by no means beneficial to it; therefore, in the morning, the motor should be again cranked over briskly to expel the kerosene from the cylinders; and the oil should be drained from the crankcase. It is well to place a half gallon of kerosene in the crankcase after draining the oil from it and running the motor for a few seconds to rinse out the case; then drain out all the kerosene and refill the case to the required amount with fresh cylinder oil. Of course, if the case contains a generous supply of perfectly clean cylinder oil, the oil may be drained into a clean can before the kerosene is poured into the cylinders, and replaced in the motor in the morning after the case has been flushed out.

2—A good course to follow in your efforts to eliminate the grinding noise in the rear axle, would be to remove the rear wheels, thoroughly examine, clean and adjust the wheel bearings, brakes and brake control mechanisms and brake drums. While the wheels are off and the rear axle of the car substantially mounted on horses or blocks, start the motor, put in the high gear and let in the clutch; if the grinding noise can be made to occur, the trouble evidently is due to lack of adjustment or wear of the gear teeth in the axle. After thoroughly cleaning and oiling the wheel bearings and brake control mechanism, replace the wheels and adjust the brakes so that they hold equally on both wheels and at the same time permit the wheels to be turned freely without dragging on the brake bands or shoes. Next start the motor, put in the high gear, and let the clutch in.

By running the motor at different speeds, and by applying the brakes for a few seconds on each speed, it may be possible to bring about the same noise that occurs

when running at 15 miles. If this is possible, while the noise is audible, have someone take up on the turnbuckle of the rear axle and see if the noise is eliminated or reduced. If the turnbuckle is tight and cannot be taken up readily, do not put a strain on it, for unless it is loose or has stretched a bit, it would not be the cause of the trouble. If the noise is bad, it might be advisable to disassemble the rear axle and have all of the parts thoroughly cleaned up, adjusted and fresh lubricant put into the casing. If the gears are worn the only remedy is the refitting of new gears.

EXCESS OIL IN FRONT CYLINDER

Mattoon, Ill.—Editor Motor Age—I have a model 46 Overland roadster that gets too much oil in the front cylinder. It does not come from the pump as I cut the oil supply from that source entirely off and the condition still exists. This condition began when the car had been run about 800 miles and have run it about 800 miles since. I have had to clean the cylinder and grind the exhaust valve twice, and each time found a very heavy carbon deposit. When the valve is seating there is a good compression and no knock. Coal oil will lie on the piston all night and not leak through into the crankcase. The front springs have straightened, letting the front of the car down probably $\frac{3}{4}$ -inch, but outside of that I can find nothing different from the original condition. Will Motor Age give diagnosis and treatment?—Dr. J. G. Baker.

In all probability the seat of your trouble is in the flattening of the front springs, which allows the motor to be tipped forward so that too much oil is splashed into the forward cylinder. It probably will be found also that the rear cylinder is not being supplied with enough oil. If you will have the front springs rebuilt, connect up the oil pump and then adjust the oil level by the petcock in the crankcase, you should have no further difficulty.

PREPARING FOR WINTER

Roodhouse, Ill.—Editor Motor Age—Through the Readers' Clearing House will Motor Age give me the following information:

1—Instructions for cleaning radiator on the 1911 Rambler, model 63.

2—Formula for anti-freezing mixture for use in same.—Edward H. Lee.

1—The entire cooling system should be drained and flushed out as well as the radiator. This is done by disconnecting the hose at the top of the radiator, then applying a hose from a hydrant to the top of the radiator, starting the motor and allowing a stream of fresh water to run through the cooling system for an hour or so. To remove incrustations, perhaps the safest method is to consult the steam engineers of the locality as to the best boiler-cleaning compound and use this for cleaning out the cooling system. The deposits formed in the cooling system of a

motor, or in steam boilers vary in different localities and different cleaning compounds are required.

A good compound for general use is a solution of common washing soda, crystals of soda, in water, the proportions being about 2 pounds of washing soda to each gallon of the water contained in the cooling system.

This solution should be put into the radiator and the motor run for a few minutes to distribute it; then left to stand in the motor over night. In the morning the motor should be started and run for a few minutes, until it becomes warm, after which the solution must be drained and the cooling system thoroughly flushed out.

2—There are several anti-freezing solutions in general use, but the combination alcohol, glycerine and water solutions are the most popular.

For over 5 degrees below zero:

Alcohol	15 per cent
Glycerine	15 per cent
Water	70 per cent

For 15 degrees below zero:

Alcohol	17 per cent
Glycerine	17 per cent
Water	66 per cent

Both of these questions were answered more in detail in a special article on equipping a car for the winter, which appeared in Motor Age October 26. Other directions of winter use are given.

MOTOR REFUSES TO STOP

Little Rock, Ark.—Editor Motor Age—Through the Readers' Clearing House I would like information relative to my car which is a 1910 model, Hudson 20 roadster. For some time I have been having trouble in stopping the engine. I start and run on the magneto exclusively, and use no batteries. I have no trouble in starting it, one or two turns always starting it. But the trouble is in stopping. After it stands a while and gets cold afterwards, no matter how long I run or how short the run, it will stop only after I have stopped it several times by shutting off the gasoline or killing it by starting on high. I cannot see but what the trouble is all in the magneto. Would Motor Age advise me to send my car to the factory?

Repairmen have worked on it but of no avail.—A Subscriber.

The cause of the failure to stop when the switch on the coil is thrown to the off position is probably due to loose connections either at the points marked 2 on the coil or magneto in Fig. 5, or that the steel spring leading from point 2 on the magneto does not make proper contact with the center screw. Either of these causes will result in failure to short-circuit the armature of the magneto, which is necessary to stop the motor. If there are indications that the motor overheats, the continued running might be due to self-ignition. This is caused by particles of carbon or projections of the cylinder casting becoming incandescent and acting as sparking points.

FACTS ABOUT BLITZEN BENZ

Chicago—Editor Motor Age—If possible, please favor me with the following concerning Burman's 200-horsepower Blitzen Benz racing car. I would like the size of the cylinders, number, stroke, bore, wheelbase, wheels, and gear ratio.—E. M. S.

Burman's Benz was made in the factory of Benz & Co., Mannheim, Germany. It has a four-cylinder motor with a bore of 7.2835 and a stroke of 7.8741 inches. This gives it an S. A. E. rating of 84.7 horsepower. The cylinders are cast in pairs, and the overhead valves are on opposite sides and operate from a single camshaft, which is on the right side. Two magnetos are used with a complete ignition system for each, there being one plug in each cylinder for each system, making eight plugs in all.

Lubrication is by splash feed in the crankcase and by hand pump, while the cooling scheme consists of a Benz radiator system and gear pump. There are four speeds with direct on high in the selective sliding gearset, from which power is transmitted to the rear wheels through a jackshaft and side chains. The tires are 32 by 4 inches in front and 34 by 5 in the rear, and the wheelbase is 108 inches. As near as can be figured, the gear ratio is about 1 to 1, the sprocket 34 to 34 and the bevel gears are 25 to 29.

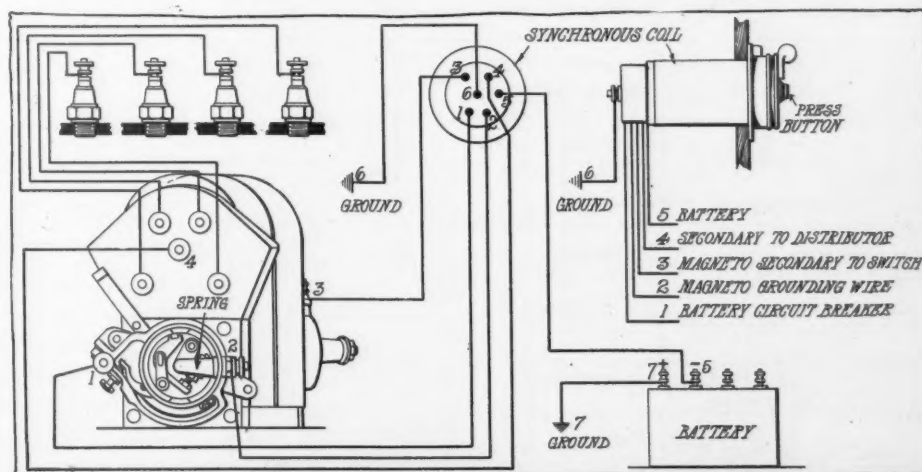


FIG. 5—WIRING OF HUDSON, SHOWING WHY MOTOR FAILS TO STOP

Minutes Mean Money in Car Factory

IN passing through any large manufacturing plant where thousands of employees are busily engaged in almost as many different kinds of work, it is a source of wonder to the thinking man, as to how it is possible to keep so many persons constantly engaged, to keep an accurate account of the amount of work they are doing and the time required to do it; then to keep an account of the cost of the work so that the price of the part made may be fairly determined. Each employee is expected to have a capacity for a certain kind of work, for which a certain price is paid, and it is interesting to learn how each workman is taken into the factory; how he is assigned to the department in which his services are required, how his ability or capacity is tested, his time kept, and a record of his progress made. In no institution is a more complete record of a man's career kept than in the high systematized manufacturing plant.

The Chalmers System

In the Chalmers Motor Co. factory, for instance, there are 2,300 employees, 2,300 individuals struggling for advancement and recognition, and in following the career of one of these individual workmen, an effort is made to unfold some of the interesting phases of the system employed.

When the work demanded from any department of the plant exceeds the capacity of the workmen therein, the foreman of that department requests the clerk of the department to make out a requisition such as is shown in Fig. 1. These requisitions are made out in duplicate, and the original is sent to the employment department, whilst the duplicate remains in the department files.

It is, of course, the duty of the employment department to keep in touch with

the various employment bureaus, applicants and other means of securing suitable material, so that the requisitions may be promptly filled.

A glance at the requisition shown in Fig. 1 reveals to the employment department just what kind of a man is wanted. The employment clerk, then, will consult his files and see if there are any applicants under the heads of carpenters suitable to fill the position. Should there be none, communication will be made with the employment bureaus, and failing there, an advertisement might be placed in the newspapers. The requisition shows the department in which the man is required, the kind of man wanted and the reason for his employment.

Some of the Red Tape

When a man is found for the position a card, the face of which is shown in Fig. 2 and the back in Fig. 2A, is made out and put on file in the employment department for future reference. Then the identification card is filled out as shown in

Fig. 3, and sent to the paymaster, who files it. The "put-on" slip, Fig. 4, also is made out at this time, and in duplicate, and put into an envelope, Fig. 5. This envelope is given to the workman, who takes it to the department in which his services are required. Here he presents it to the foreman, who, if favorably impressed with the man's ability, signs and gives the slip to the department clerk, who assigns a clock number and makes out a clock or time card, Fig. 6, but without the inscriptions marked thereon. The "put-on" slips then go to the factory superintendent, who approves and sends them to the payroll department, where the original is kept for the records and the duplicate sent to the employment department. Thus is the Chalmers factory career

of a workman begun.

Now, when the man reports for work, he takes the card bearing his number out of a rack arranged at the entrance to the factory or his department, places it in the time-recording clock and punches the time upon it; then he places it in another similar rack and begins his work. With this system, which is quite generally employed, the time clerk can tell at a glance at the board just what workmen have not reported for work. All workmen are required to be at work at a certain time; at the end of this time a record is made of the cards not transferred from the first rack, and thus a check on those who are late or absent is kept. The time again is punched or recorded on this card by the workman as he starts to work after lunch at noon; it is punched as he leaves the plant in the evening; and in the evening the card is replaced in the first rack, from which it again is to be taken on the following morning. If working overtime, the card is again

ORIGINAL
OFFICE
FACTORY

No. 8976

EMPLOYMENT DEPARTMENT: February 18th 1911

Please Employ for the Carpenter Department

One Man At 35 cents per month per hour

Description of help wanted First Class Carpenter

To Replace John Smith

To increase the forces to secure larger output.

Permanent. Check

Temporary.

No longer employed.

Transferred to Repair Dept.

Promoted in this department.

To be paid in full

For this position I recommend the Employment Reinstatement of A. H. Sherwood Foreman

Address

Factory Mgr. or Supt.

NOTIFIED.
NOT NOTIFIED.

FIG. 1—REQUISITION FOR HELP

CHALMERS MOTOR COMPANY
EMPLOYEE'S RECORD

NAME G. A. Trombley DATE

ADDRESS 276 Jefferson Avenue AGE

POSITION Carpenter MARRIED OR SINGLE Married REQUISITION NO. 8976

EVER EMPLOYED HERE? NAME OF RELATIVES HERE M. Trombley

REINSTATED No. DEPARTMENT

WHOM SHALL WE NOTIFY IN CASE OF AN EMERGENCY?
NAME M. Trombley

ADDRESS 368 Main Street Detroit, Michigan.

FIG. 2—FRONT SIDE OF EMPLOYEE'S RECORD CARD

DATE	DEPARTMENT	FOREMAN	CHECK NO.	RATE	KIND OF WORK OR MACHINE
	Carpenter	A.H. Sherwood	100	35	Joiner
	TRANSFERRED TO				
	TRANSFERRED TO				
	TRANSFERRED TO				
EMPLOYMENT ENDED		DISCHARGED	QUIT	LAID OFF	
REMARKS					
CHARACTER HABITS ABILITY RE-EMPLOY?					
RATE CHANGED FROM					
DATE					

FIG. 2A—BACK OF EMPLOYEE'S RECORD CARD

Paymaster's Identification Card

Mr. G. A. Trombley

Employed 2-10-11 Ended 2-10-11

G. Snyder
Manager Employment Dept.

I have this day received all money due me from CHALMERS MOTOR CO. and hereby relieve said Company of all liability which may have been incurred during my employment with said Company.

1911

FIG. 3—IDENTIFICATION CARD

punched in and out in the evening. While the workman is busily engaged in performing the work laid out for him, the accounting departments are keeping a record of his work, making up the payroll and charging or figuring the costs of the finished products. When a man's put-on slip reaches the payroll desk a clerk inscribes the name of the workman and his number and rate of pay, on the current

CHALMERS MOTOR CO.
DETROIT, MICH.

REQUISITION NO. 8976

BEGIN WORK 6:30 A. M. Feb. 10, 1911.

TO THE PAYMASTER'S DEPT.

PLEASE ENTER ON THE PAY-ROLL THE NAME OF
G. A. Trombley

CITY ADDRESS: 276 Jefferson Ave.

EMPLOYED AS Carpenter

IN THE Carpenter DEPT.

AT THE RATE OF 35¢ PER HOUR PER MONTH

FORWARD ON HEAD OF DEPT.

FACTORY MAN. OR DEPT. EMPLOYMENT DEPT.

G. Snyder

FIG. 4—THE PUT-ON SLIP

payroll. The slip then is given to the addressograph clerk, who makes up a permanent record in the files of the addressograph. The addressograph is a machine used to print the payroll sheets, the clock cards and the pay envelopes; it is absolutely accurate and gives a saving in labor equal to that of at least three clerks.

In order to secure an absolute record

WATCHMAN BUILDING NO. 1

PASS BEARER G. A. Trombley

TO Carpenter DEPT.

NOTE—This envelope contains a Put-On Slip which is to be delivered by bearer to

Mr. A. H. Sherwood
CHALMERS MOTOR CO.

FIG. 5—PUT-ON SLIP ENVELOPE

of the cost of labor performed in the making of each piece that goes into the make-up of the complete motor car, as soon as a man starts work the factory clerk makes out a time-slip, Fig. 7. This slip has room for the record of three jobs, and the re-

capitulation of the respective amounts on each. Every time a new job is started a new slip is made out. It will be noted that there is a perforation between each job record; this is for the purpose of making them detachable, so that the work of the cost department may be facilitated.

Pay Ending May 15 1911

No. 1001 NAME John Smith

CHALMERS MOTOR CO. DETROIT

DEPT. 1001

RECEIVED BY John Smith ON HERE

DATE May 15

IN ADVANCE FOR SERVICES RENDERED PAY-ENDING

100¢

FIG. 6—THE CLOCK CARD

For each working day, a workman's records will show either a recapitulation or an absent slip, Fig. 8, which is filed under the man's clock number. Girls, expert in the operation of comptometers, or multiplying machines, whose monthly salaries average about \$40, make all extensions; that is, they figure and fill in the amounts due the workmen. At the end of each payroll period these amounts are added and compared with the clock card, thereby checking the amounts due the workmen against the cost records.

DEPARTMENT No. 24

NAME John Smith CLOCK NO. 602

ORDER NO. 7 PART NO. 7 BOX NO. 7 NO. PIECES 7 ACCOUNT NO. 7

OPERATION 7 TIME 7 RATE 7 AMOUNT 7

TIME STARTED 7 FINISHED 7

FOREMAN'S O. K. 7

DEPARTMENT No. 24

NAME John Smith CLOCK NO. 602

ORDER NO. 7 PART NO. 7 BOX NO. 7 NO. PIECES 7 ACCOUNT NO. 7

OPERATION 7 TIME 7 RATE 7 AMOUNT 7

TIME STARTED 7 FINISHED 7

FOREMAN'S O. K. 7

DEPARTMENT No. 24

NAME John Smith CLOCK NO. 602

ORDER NO. 7 PART NO. 7 BOX NO. 7 NO. PIECES 7 ACCOUNT NO. 7

OPERATION 7 TIME 7 RATE 7 AMOUNT 7

TIME STARTED 7 FINISHED 7

FOREMAN'S O. K. 7

DEPT. NO. 24 NAME John Smith CLOCK NO. 602

HOURS OVERTIME 60 RATE OVERTIME 20 AMT. O. T. 12.00

HOURS REGULAR 20 RATE REGULAR 20 AMT. REG. 4.00

PRODUCTIVE 7 NON-PRODUCTIVE 7 TOTAL 17.00

FIG. 7—WORKMAN'S TIME SLIP

Name JOHN SMITH No. 0001

Dept. LATH Date 2-12-11

Time and Payroll Dept.

The above employee was absent today.

Dept. Time Clerk JENKINS

FIG. 8—WORKMAN'S ABSENT SLIP

In case a workman wishes to leave the plant at any time during the day, other than during the noon period, he must get a pass-out slip, Fig. 9, from the foreman, which is collected by the watchman at the factory gate. This also is a check on the time records and tends to prevent theft.

Individuality Is Not Lost

Considering, for a moment, the possibilities for advancement of a workman, in a large plant, the card reproduced in Fig. 10 will serve to show that individuality is not entirely lost, and that a man is not a mere machine. Character will assert itself, and advancement is such a common occurrence in the Chalmers plant that a special advancement card is used. When a foreman, who always is in close contact with his workmen, thinks a man worthy of a raise in pay, card, Fig. 10,

PASS OUT

Name John Smith

Check No. 7 Dept. No. 7

STOPPED WORK.

Date 7 A. M. 7 P. M.

Foreman 7

FIG. 9—WORKMAN'S PASS

is filled out and sent to the employment department, where a record of the change is made on the back of card, Fig. 2A; then it is sent to the factory superintendent for his O. K. The card next passes into the payroll department, where the increase in the rate of pay is made, beginning with the next payroll period, the 1st or 16th of each month.

Should the transfer of a workman from one department to another be desired, card Fig. 11 would be filled out in the department in which the workman is employed, and sent to the foreman of the other department, who approves and gives it to the clerk that he may assign a new department number. This card then goes to the employment department, which keeps the duplicate copy and posts onto card 2A and delivers the original to the payroll department for the necessary changes of the payroll records.

The discharge card, Fig. 12, is made out by the department clerk when a workman leaves the employ of the company. This card, then, is signed by the foreman

ORIGINAL.
CHALMERS-DETROIT MOTOR CO.
Department Transfer.

Feb. 18, 1911

Time and Pay Roll Department:

Please transfer Mr. G. A. Trombley

Present work Carpenter

Rate 35 Check No. 100

From Carpenter Department

To Repair Department

(Class of work transferred to Repair Body)

beginning 6:30 A.M. Or. 10- 11

X X X X

Manager or Supt. Foreman.

O. K. _____ Foreman. (Dept transferred to)

O. K. _____ Supervisor (Dept transferred to)

O. K. _____ Employment Department

O. K. _____ Tool Supply Department

O. K. _____ Hand Tool Supply Room

O. K. _____ Time and Pay Roll Department

New Check No. 305 New Rate 35

Employee's Record in the Department from Which He is to be Transferred

Ability Good

Department Good Character Good

FIG. 11—WORKMAN'S TRANSFER CARD

Original.

CHALMERS MOTOR COMPANY, DETROIT, MICH.

Date Feb. 18, 1911

Paymaster: Chalmers Motor Company, please pay

Mr. G. A. Trombley Check No. 100

Department Carpenter Class of Work Carpenter

Hours worked week ending _____ Amt. \$ _____

Hours worked week ending _____ Amt. \$ _____

Total amount in full to date, \$ _____

Note—All pay-off slips should be signed in the consecutive order of the figures below. The report on the duplicate must be at all times be considered strictly confidential, and should always be sent under seal and it reaches the EMPLOYMENT DEPARTMENT.

(1) Foreman or Head of Department. (3) Employment Department.

(2) Manager or Superintendent. (6) Time and Pay-Roll Department.

TOOL RECEIPT.

All Tools and other property owned by the Company and charged to Mr. G. A. Trombley Check No. 100

Have been returned in good order except the following:

3 Files	30
---------	----

The paymaster will deduct from the Pay of above Employee \$ _____ which is the cost of the tools or other property enumerated above.

(4) Hand Tool Supply Room. (5) Tool Supply Department.

FIG. 12—THE ORIGINAL AND DUPLICATE DISCHARGE SLIPS

and factory superintendent, and sent to the employment department, where a duplicate is kept, to be posted on card 2A, and the original sent, first to tool supply rooms, to see if the workman is responsible for tools belonging to the company; then to the payroll department, where time is figured for final settlement. A clock card then is sent to the paymaster made out as shown in Fig. 6. On being paid off, the workman signs the identification card, Fig. 3, also the clock card, Fig. 6, acknowledging receipt of all moneys due.

Paying the Workmen

On pay days the clock cards, with the amount due the workman inscribed on the

front, as at the right in Fig. 6, are given to the men for their inspection as to accuracy. If satisfactory, the workman signs the card, gives it to the paymaster in exchange for the envelope, Fig. 13, which is supposed to contain the proper amount. Should there be any discrepancy in the time the card need not be signed until rectified, and there is a printed request on the pay envelope to the effect that they be opened immediately and money counted.

When a man is accepted by the employment department for a regular salaried position, the salary card, Fig. 14, is made out, sent to the department in which the man is to be employed, and after being approved by the general manager is sent to the salaried payroll clerk.

2,300 on Payroll

In this way 2,300 employees are paid twice each month and an absolute record of their work, attendance and character is maintained throughout their working careers.

Duplicate.

CHALMERS MOTOR COMPANY, DETROIT, MICH.

Date Feb. 18, 1911

Paymaster: Chalmers Motor Company, please pay

Mr. G. A. Trombley Check No. 100

Department Carpenter Class of Work Carpenter

Hours worked week ending _____ Amt. \$ _____

Hours worked week ending _____ Amt. \$ _____

Total amount in full to date, \$ _____

Note—All pay-off slips should be signed in the consecutive order of the figures below. The report on the duplicate must be at all times be considered strictly confidential, and should always be sent under seal and it reaches the EMPLOYMENT DEPARTMENT.

(1) Foreman or Head of Department. (3) Employment Department.

(2) Manager or Superintendent. (6) Time and Pay-Roll Department.

Confidential Report for Employment Record

Why paid off? Leaving of own accord

If leaving of own accord, why? Leaving the city.

Do you expect to restate? No

Ability Good

Character Good

Department in factory Good

Would you re-employ in your department? Yes

Do you think it is advisable to re-employ elsewhere? Yes

CHALMERS MOTOR CO.

OPEN IMMEDIATELY

FIG. 13—PAY ENVELOPE

By means of this system, the Chalmers company is enabled to keep its good workmen and thereby increase the quality of workmanship entering into the construction of its product. Idleness or soldiering is reduced to a minimum; and by keeping an accurate record of the cost of manufacture of the various parts it is possible to place a legitimate price upon the finished product which is entirely sat-

CHALMERS-DETROIT MOTOR CO.
DETROIT, MICH.

D. W. P. W. _____

Feb. 18, 1911

To the Paymasters Dep't. _____

Please Change Rate of M. R. G. A. Trombley

Check No. 120

Carpenter Department

Class of Work Carpenter

Reasons for Change Good workman

To take effect March 1. 1911

from 35¢ per hour to 37¢

Date last increase _____ Amt. \$ _____

Foreman _____

Emp. Dept. _____

Supt. _____

Factory Mgr. _____

Paymaster _____

Cornell 10716

FIG. 10—RAISING THE PAY

isfactory to the customer. In the manufacture of an article, the question of primary importance, and the one upon which all other calculations are based, relates to the cost of production. This cost may be separated by analysis into various divisions, depending on how much detail is wanted in the classification. Of these divisions, the labor cost may be picked as the most important, the most variable, and, in many cases, the largest in amount. In general, the labor cost increases proportionately to the complexity of the article manufactured.

Cornell 10716

SALARY MEMO.

TO THE AUDITOR DATE 2-18-11

PLACE ON THE PAY ROLL BEGINNING February 18th 8:00 A.M.

NAME John Smith

ADDRESS 376 High Street

POSITION Stenographer MONTHLY RATE \$ \$00.00

REMARKS In Receiving Department.

APPROVED BY _____ GEN MGR APPROVED BY _____ EMP DEPT.

APPROVED BY _____ PYRAMID HEAD

FIG. 14—CARD MADE OUT FOR SALARIED EMPLOYEES

Shall Hand Spark Control Be Retained?

THE question very often arises as to whether spark control by hand on the steering wheel should be retained or if it is not preferable, for the sake of simplicity, to eliminate it. To solve this question is necessary to analyze very closely the phenomenon of ignition; this analysis will allow, at the same time, to estimate the degree of usefulness of the automatic spark control.

The problem of ignition in combustion engines was a difficult one to solve on account of the great rotary speed; this is realized if one considers the requirement to ignite the mixture, without any missing, at the right moment where it has to produce the maximum useful effect. It has been observed that flame propagation does not occur instantly, even when the volume is constant. Its duration is so prolonged when the combustion is taking place behind the piston. The heat developed by the spark brings the neighboring molecules to their temperature of ignition; these in turn, burning, heat up the next neighboring molecules and thus takes place the combustion of the whole mass, with a speed depending upon the composition of the mixture.

Combustion Comparatively Slow

Of the mixtures in the engines, the combustible quantity is relatively small and the explosion is, so to speak, a conflagration whose wave is travelling by concentric spheres at a variable speed according to compression, from 14 to 35 feet per second. This is a very slow speed if one compares it with the speed produced by explosion of melinite, which is 21,000 feet per second. Consequently there is a lapse of time from the moment the spark is produced up to the moment when the whole mass is inflamed which is not at all negligible. If this lapse of time is expressed in degrees of rotation of the flywheel for various angular velocities of the motor one obtains a series of values which are interesting to follow. For instance: In an engine where the farthest end of the vaporous mass is 4 inches away from the spark plug and a combustion speed of gas of 17 feet per second, we find successively: For 500 revolutions per minute, 60 degrees; for 1000 revolutions per minute, 120 degrees; for 1500 revolutions per minute, 180 degrees, which correspond with a lapse of time 12 degrees per 100 revolutions per minute.

In reality these figures can be diminished by more than one-half, due to the speed with which the mixture is drawn in by the travelling piston, and by increased compression, as the combustion speed is greater.

Consequently, if the good working of the engine demands that the mixtures be entirely inflamed at the moment the piston is going to leave top dead center, it is necessary that the spark be produced be-

fore the piston reaches this point; this angular distance is going to be so much greater as the speed of rotation increases. This angular distance, which is depending upon the combustion speed of the mixture, is going to vary with the compression and even with the density of the mixture. It follows that, for instance, at 1,000 revolutions per minute the angular distance will be smaller, the richer the mixture is, or greater the poorer the mixture is.

This is not all. To complete the observation of the necessity of the spark control, you have yet to distinguish between what ought to be called apparent ignition and real ignition. The apparent ignition corresponds to the moment when the special apparatus is in action to produce the spark, that is, when the magneto distributor is on contact. The real ignition corresponds to the moment when the spark is actually produced. Between the two there is time lost which becomes more important as the mechanism of the ignition system is less precise and as the hysteresis of its magnetic circuit, the self-induction of its electric circuit, and the electric capacity of its condenser are greater. This time lost acts like the first one: The operator is compelled to time the apparent ignition at a certain moment before the piston reaches the top dead center. The angular distance corresponding to this latter lost time is independent of the composition of the mixture and is in proportion to the rotation speed of the engine. The total of the angular distance emanating from the combustion speed and from the time lost in ignition constitutes what is known as the angle of ignition advance. The preceding analysis permits of drawing the following conclusions:

Conclusions Arrived At

1—With given intake conditions the ignition advance is proportioned to the rotation speed of the engine.

2—When intake conditions are changed, by action on the carbureter throttle, for a given rotational speed, the ignition advance is varying inversely to the density of the intake mass; that is to say, that for a given rotational speed there will be so many values of ignition advance, as there are variations in the intake.

It is beyond any doubt that to obtain good results it is necessary to adopt the most convenient angle of ignition advance, and it will be readily realized that this operation requires much experience and an extremely sensitive touch. To obviate these difficulties the builders have been constantly looking for other solutions. A short examination of most of them will give us conclusions:

1—Magneto and fixed advance: Some builders have adopted it notwithstanding their conviction that the variable advance is indispensable for the engine of today to give the best results in power and elasticity, contending that only experienced persons

can operate the spark advance with advantage while the large majority of operators are misusing it. The fixed advance gives constant average results instead of having excellent ones at times and very defective ones the rest of the time. Evidently, this is not a good solution.

2—Magnetos with variable advance: By moving the spark control lever on the steering wheel only the rupture cams of the primary circuit are moved. This procedure, simple, primitive, and not frail, has the inconvenience that it furnishes a weaker spark at retarding than at advancing positions. This inconvenience is grave, because it is at low speeds that retarding is required and when the ignition is already weakened by the fact that the magneto furnishes a spark heat in direct relation to its speed. Bosch has remedied this inconvenience in his magneto reinforced for retarding, furnishing a spark as hot in retarding as in advancing.

Magneto Arrangements

3—Magnetos with variable advance: As in the proceeding one the hand lever moves the rupture cams of the primary circuit, at the same time drawing along a special device which causes a displacement of the magnetic field; thus, there is always a spark obtained, no matter what the advance.

4—Magneto with helicoidal spark advance: This system consists in changing the position of the armature of the magneto towards the motor while running, and permits of having always a spark at the maximum moment. However, it is difficult to install it in an engine that was not specially constructed for adopting it.

5—Magneto with automatic advance: This system is similar to the preceding one, but is actuated by a governor; it would be perfect if the necessary advance were in all cases proportioned to the engine speed; we have seen that this is not the case and that the advance is variable with the numerous conditions of the intake which this system is not capable of overcoming. These magnetos are of a greater size and price and do not seem to be popular.

6—Twin ignition: This type of ignition is of advantage, giving the advance without any mechanical device by means of the two-spark magneto. As the mass is ignited at two opposed points, it reduces the time of combustion to almost nothing and consequently also the corresponding spark advance. There remains only to be taken care of the time lost in producing the spark, which is easy to do as it is proportional to the engine speed.

In recapitulating it is noted that the spark advance is essential and it has to be operated by the driver. The automatic scheme is not capable of solving the problem in a satisfactory way. The two-spark gives good results.—From Omnia.

Five Franklin Models for Next Year

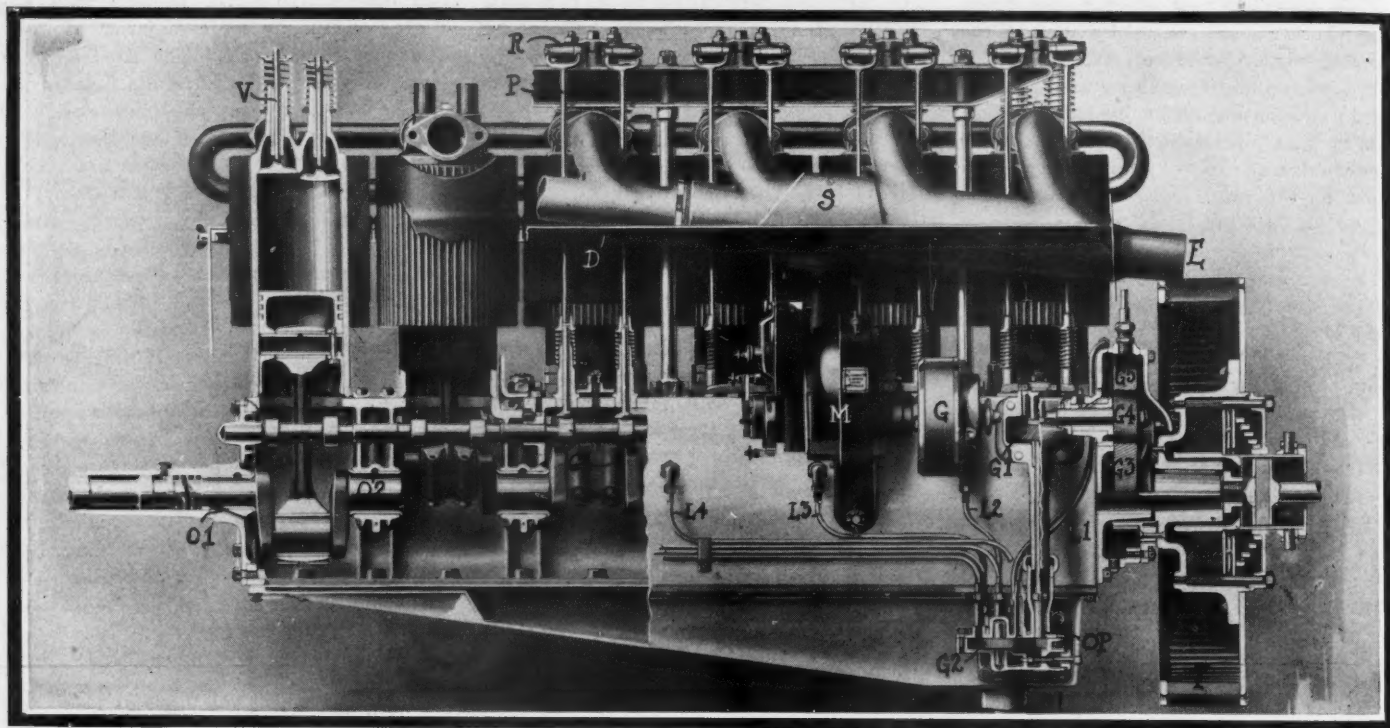


FIG. 1—EXHAUST SIDE OF FRANKLIN AIR-COOLED MOTOR

Illustrating the method of cooling in which air is drawn past vertical flanges radiating from cylinders from top to bottom by fan F. The lubrication system is also shown

EARLY in the present season the H. H. Franklin Mfg. Co. stated that for the future improvements would be incorporated in its cars and new models brought out as soon as such changes seemed wise, without reference to the time of year. Although Franklin cars for the coming season are the first of the products of this factory under the no-yearly-model policy, several changes in its line are to be noted. The cars are not designated as of 1912 model; each bears its model letter, but no yearly label.

The distinctive Franklin features are retained; the sloping hood, the air-cooled motor and the wood frame still are distinguishing characteristics of these cars. In general appearance, too, there is slight change except in refinement of body details. The number of chassis models has been augmented by the addition of a chassis with a four-cylinder motor of 25 horsepower. This is to be known as G-4-25, and is added to supply a more powerful car for touring bodies than is offered by the 18-horsepower model G chassis for runabouts, which is to be called the G-4-18. The model M, which appeared this year as a four-cylinder chassis, has a six-cylinder motor of 30 horsepower, catering to that class of the trade which prefers a six-cylinder motor in a light car.

The Six-Cylinder Models

The other two models, D and H, are both continued as six-cylinder chassis, the size of the motor of both being 4 by 4

inches, the same as the model D this season and a material reduction in the case of the model H from the dimensions of 4½ inches square which it had during the present season.

The motors of all five models have a stroke of 4 inches and the tendency exhibited in previous models toward a square motor is still in evidence. Three of the models have stroke and bore the same, the two departures being the G-4-18 with its 3¾-inch bore and the model M with 3½-inch cylinder diameter.

Franklin motors are all alike in general

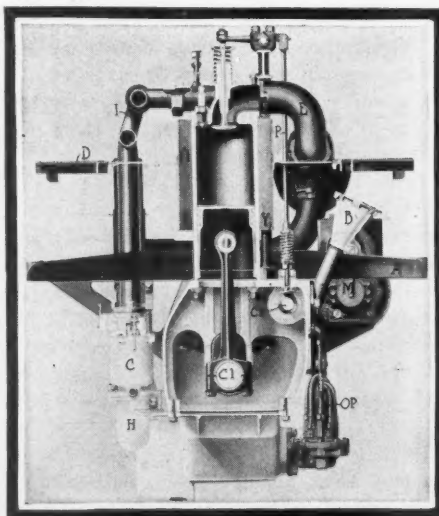


FIG. 2—SECTION THROUGH CYLINDER
The cylinder construction, with the arrangement of oil pump, carburetor and magneto

design and construction, the only difference in the various models being in the number and dimensions of the cylinders, with a slight variation in the case of the model G in the lubricating system. The chief feature of the motor is, of course, the air-cooling.

Auxiliary Exhaust Omitted

Practically the only alteration for the new season in the motor is the omission of the auxiliary exhaust. This formerly was located at the bottom of the combustion chamber, permitting 70 per cent of the hot exhaust gases to leave the cylinder at the end of the power stroke. The arrangement was introduced in early Franklin models when unconfined air currents circulated over horizontal cooling flanges. When the 1910 vertical flange system of cylinder cooling was designed, experiments were at once begun to ascertain whether the motor would operate satisfactorily without this second exhaust. Now that 2 years of rigorous testing have satisfied the Franklin people that the motor is fully efficient with the one exhaust, the auxiliary is omitted as a step toward simplicity.

The general construction of the motor is shown in Figs. 1, 2 and 3. Fig. 1 is a view of the exhaust side of the motor with portions cut away to show the design. Fig. 2 is a section through one cylinder and Fig. 3 is the intake side of the motor as a whole. It will be seen that the cylinders are cast separately with the valves located in the head. A deviation

Auxiliary Exhaust Ports Discontinued

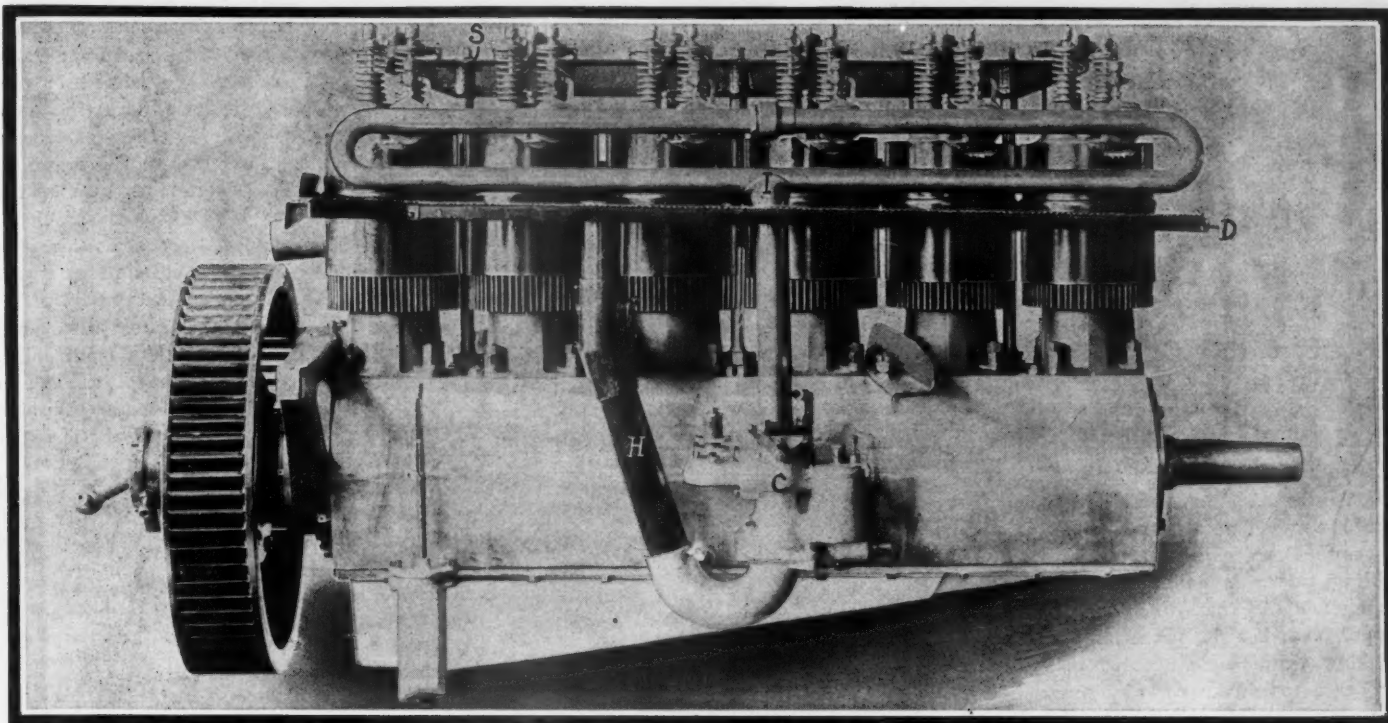


FIG. 3—INLET SIDE OF FRANKLIN SIX-CYLINDER MOTOR

This shows the deck D and the airjackets around each cylinder, by which the air is forced to pass around the cylinders for cooling. This also shows the hot-air pipe H, which carries warm air from the exhaust pipe to the carburetor C

from former Franklin practice is evidenced here, in that the valves are seated directly in the cylinder castings and not in cages as heretofore. The valves V, Fig. 1, are operated by pushrods P, through rocker arms R. The pushrods are actuated by the cams C1, which are an integral part of the camshaft. The rocker arms are supported upon an I beam which is in turn bolted to the engine base through the upright columns Y, Fig. 2, and not to the cylinder head, thus preventing any loss of adjustment due to expansion. The timing gears have spiral teeth and run in oil. The valves themselves are of silico-manganese steel.

Franklin Air Cooling

Intake and exhaust valves are of the same size on the D and M models but vary on the G, the smallest model, the exhaust being $1\frac{1}{4}$ inches in diameter, while the intake valve is but $1\frac{1}{2}$ inches. On the model D motor the largest diameter of the exhaust valve is $1\frac{15}{16}$ inches with an overall length of $5\frac{15}{16}$ inches. Valve timing is comparatively easy. The positions of the valve upon the walking beams are regulated by the turning of a lock nut against the walking beam adjusting screw.

The only moving part of the cooling system is the flywheel, which is a suction fan, and is illustrated with the clutch in Fig. 6. It consists of a steel plate F and a narrow rim of the same diameter as the plate. Between this rim and plate are riveted small concave blades V. As the

fan revolves it throws air from its center out between the concave blades. At low speed there is strong pulling power in this fan, and an active circulation of air in the cooling system which increases in proportion to the speed, is induced.

The construction of the cylinders is original with the Franklin cars to facilitate the air-cooling scheme. The cylinders are of selected gray cylinder iron and when they are made there are cast into the exterior surface at intervals of $\frac{3}{16}$ of an inch flanges F1, Fig. 2, which are 8 inches long, a trifle more than 1 inch

wide and $\frac{1}{16}$ inch thick. These flanges project 1 inch from the cylinder and are set into the cylinder about $\frac{1}{8}$ inch, as shown in the sectional view of the motor, Fig. 1. The flanges are tinned before casting to insure a firm joint with the cylinder iron. This makes the exterior surface of a cylinder twelve times as great as the surface of the combustion, so that there is twelve times as much area for the radiation of heat as there is for absorption. To confine the air to this heat-radiating surface, there is placed about each cylinder with its flanges a sheet-metal jacket which resembles a short section of stove pipe.

The method employed for sending the air through this airjacket is simple. A sheet-metal deck D, Figs. 1, 2 and 3, is so placed that it touches the dash and the sides of the hood and also the air-jackets about midway between top and bottom. The hood and this deck form an air chamber above the motor. The engine boot, the lower half of the hood and this deck form an air chamber below the motor. Between the two air chambers the only passage for air is down through the airjackets wherein are the cooling flanges.

Suction from Fan

As the motor rotates, the flywheel revolves and tends to create a vacuum in the lower air chamber. This brings the currents of air down from the upper air chamber, all of which pass over the cooling flanges. The air from the upper chamber is replaced by relatively cool, fresh air which

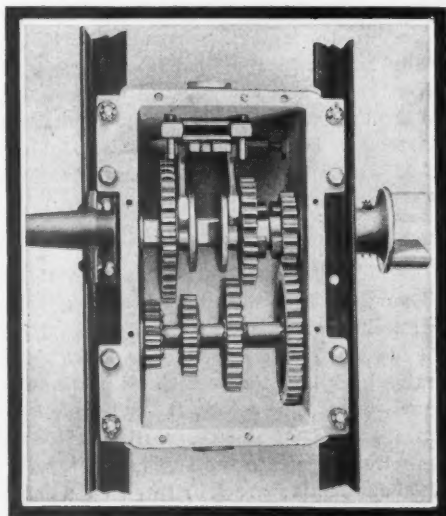


FIG. 4—FRANKLIN GEARSET
Showing compact construction and method of mounting the case

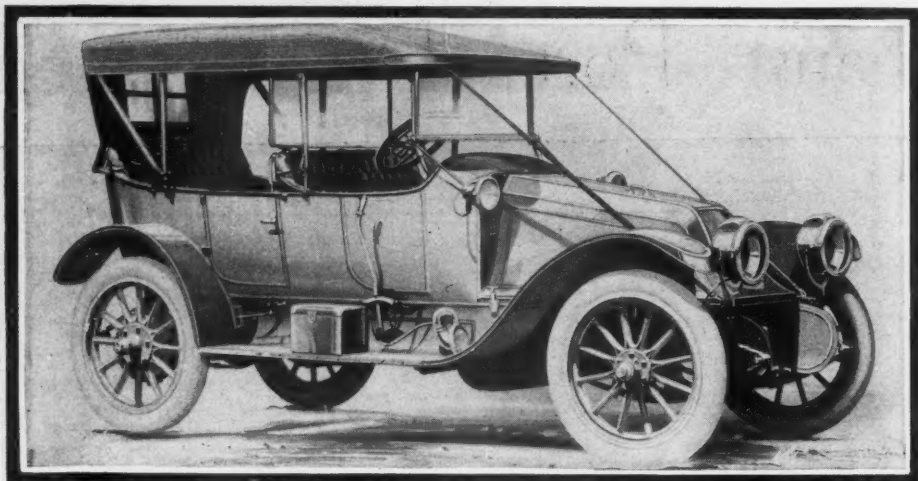


FIG. 5—FRANKLIN TORPEDO PHAETON ON MODEL D CHASSIS

Note the second windshield placed on the back of the front seat for protection of the occupants of the rear seat and to give exclusiveness to the tonneau

passes in through an iron grill in the front of the hood. The partial vacuum generated by the revolving flywheel is equal throughout the chamber and therefore this pulling power is equal at each cylinder, and since the supply of fresh air in the upper chamber is practically unlimited, owing to the ample opening in the hood, an equal volume of air passes down through each airjacket and all cylinders are cooled alike.

Franklin Lubricating System

The oiling system is of the circulating force-feed type and is shown in Fig. 1. The oil is contained in a subbase which is bolted to the bottom of the crankcase and separated from it by a wire gauze. Both the base and subbase are aluminum. The subbase in the sixcylinder models is beneath cylinders 3, 4, 5 and 6, and in four-cylinder models runs the whole length of the base. Its lowest part is under the last cylinder, at which point are located an oil gauge, an oil pump OP and a screw plug D1 for draining.

From the pump an individual lead runs to each main crankshaft bearing. The individual oil lead L1, L2, L3, etc., to the bearings runs directly from the oil pump. The leads between the pump and the point where they enter the engine base are exposed so that any difficulty in this part of the oiling system may be readily located before a cylinder is damaged. Oil which is forced through each individual lead to the main bearing passes into a groove O2 in the upper half of the base bearing bushing. Another smaller oil groove intersects the first groove and extends almost the full length of the bushing. A drilled hole in the crankshaft communicates with the grooves in the base bearing bushings one-half of each revolution and the oil under pressure in the base bearing bushings passes through this groove and is carried through the crank throws into grooves in the connecting rod bushings, the lower halves of which are identical with the base bearing bushings described.

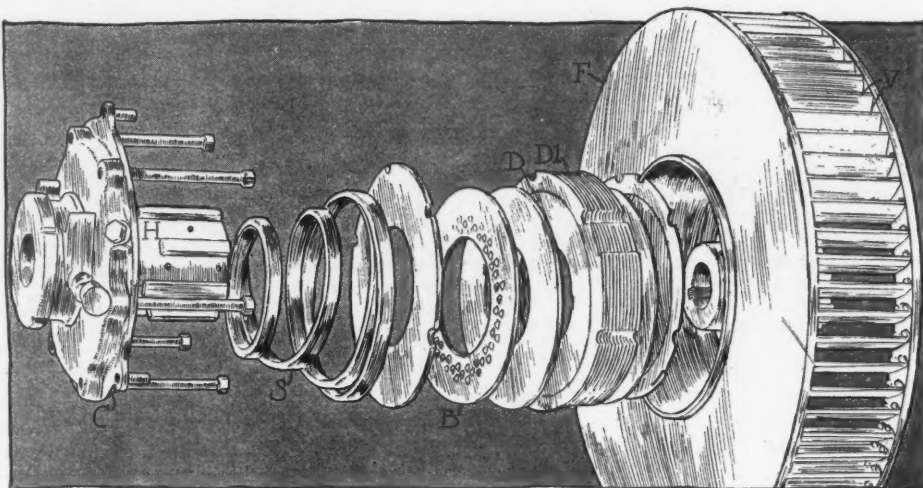


FIG. 6—MULTIPLE-DISK CLUTCH AND FLYWHEEL FAN

Clutch is composed of alternate bronze and steel disks and is incased in the flywheel. The arrangement of the vanes V in the flywheel is shown at the right

The oil which is carried to the connecting rod bearings is forced out of the connecting rod bushings and then thrown off the end of the rapidly revolving rod in the form of a fine spray. This spray fills the engine base with a fine mist, lubricating the bearings, cylinders, pistons, crankshaft, valve lifters and all the interior parts of the motor. From the cylinder walls and from the inside of the engine base the oil accumulates and drains down to the bottom of the engine base and then is strained back into the subbase through a very fine mesh gauze, placed between the crankcase and the oil reservoir.

Franklin Carbureter Retained

Besides the pipes which lead from the oil pump to the crankshaft bearings there is another which goes to a sight feed on the dash. The oil from this sight feed drains back into the rear cheek pieces and down over the camshaft and magneto gears G4 and G3 and thence back through the wire gauze into the subbase. Model G runabout motors are lubricated by a multiple force-feed from a Hancock oiler to the main bearings.

The Franklin automatic float carbureter

is the same as used this year. It has, on the six-cylinder models, an auxiliary air intake valve enclosed in the compartment H, Fig. 7, and operated by the suction of the motor. Two coil springs keep the valve seated except as the motor pulls strongly under hard work when the valve opens and extra air is admitted in proportion. There are two adjusting nuts 1 and 2 for changing the tension of these springs. The throttle connection is indicated at T. The temperature of the vapor on its way to the combustion chamber may be regulated by a hot-air pipe H, Fig. 3, which draws its supply from a sleeve S, Fig. 1, about the exhaust.

From the carbureter the mixture passes upward to an endless intake manifold I, Figs. 2 and 3, in the form of a loop, to the lower side of which comes the pipe from the carbureter, while from the upper

side project the leads to the cylinders. Thus, the mixture must pass at least half way around the manifold.

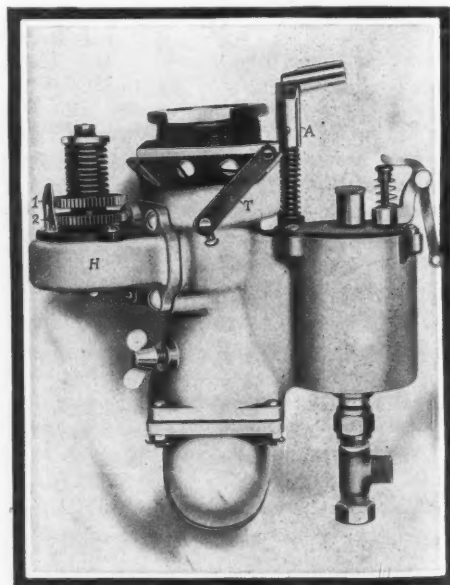


FIG. 7—FRANKLIN CARBURETER

With hot-air intake from exhaust pipe and dash adjustment of needle valve

Bosch dual ignition is used, a high-tension magneto M, Fig. 1, furnishing the spark under this arrangement, while a storage battery on the running board supplies the battery ignition. All wiring is exposed as far as possible, giving accessibility to the system and preventing induction. Ignition timing on the larger models is controlled by a governor, while on the model G runabout it is constant.

Franklin Governor

The governor G, Fig. 1, is a centrifugally-regulated device operated by weights and springs within a drum. It is driven by a shaft to which is attached a gear G4, which meshes with a gear upon the cam shaft. The governor shaft has upon its end, within the governor drum, a gear meshing with two gear segments which are a part of two pivoted weights at opposite sides of the drum. As the governor

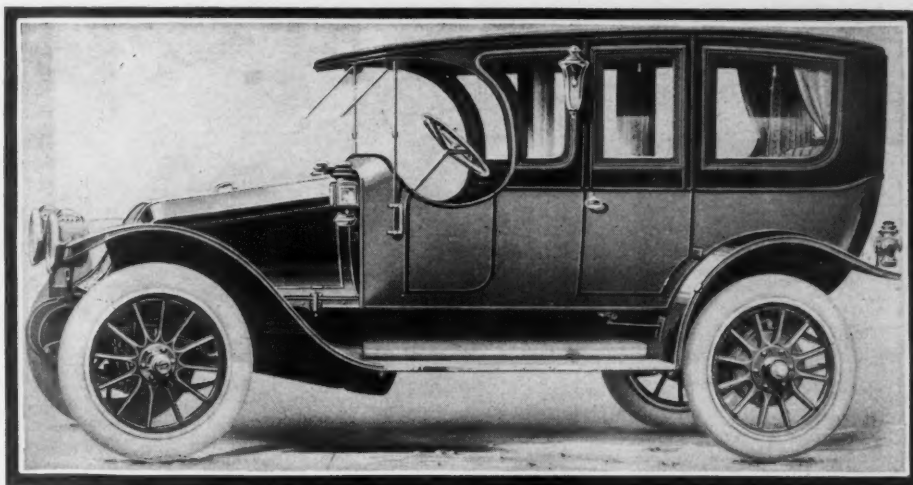


FIG. 8—FRANKLIN MODEL H COACH LIMOUSINE
A seven-passenger enclosed body on a 38-H. P. chassis with six-cylinder motor. Oval opening beside driver's seat gives an attractive finish at a point which often troubles designers

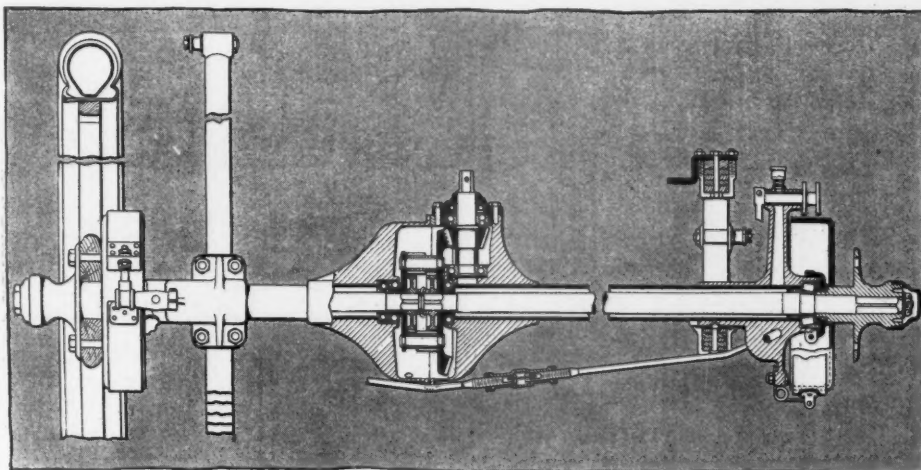


FIG. 9—FRANKLIN REAR AXLE CONSTRUCTION

The rear axle is of semifloating type with spur-gear differential. The axle is stiffened by truss fitted with turnbuckle for adjustment

shaft revolves, these weights tend to move toward the circumference of the drum and pull against spiral springs. Until the revolutions per minute reach about

311 the weights have no outward movement, being retained by an automatic brake. At that point, however, they start and move outward with the increase in engine speed and advance the governor drum upon the governor shaft. The drum, being keyed to the magneto shaft, thus advances the armature and the spark.

Few Transmission Changes

So far as the transmission system is concerned there is little change in the new models. The design of the multiple-disk clutch is just the same as this year. This is inclosed in the flywheel and is illustrated in Fig. 6. It consists of two sets of disks, D and D1, fifteen of which are steel and the alternate set of bronze. The carrier C attaches the bronze disks to the flywheel by a series of long bolts which enter into notches in the disks. The steel disks are supported on a hub H, which is connected to the gearset and are anchored to it by notches in their inner circumference. Between the engaging spring S and the disks is the ball thrust B.

The gearset is of the three-speed sliding gear type with ball bearings. The shift-lever shaft runs across the top of

the case instead of through it, the idea being to permit the shifting of gears with a shorter movement of the hand. The universal joint blocks are 4 inches longer than in the 1911 models, permitting the gearshift lever to be placed that much nearer the driver's seat. The gearset and its method of support are shown in Fig. 4.

Propeller Shaft

The propeller shaft is of heat-treated steel with final drive through a spur-gear differential. A semi-floating rear axle is used as for the 1911 models; those before that had floating axles. In the gear ratios Franklin cars show a change from the practice of most makers in which 3.5 is usual. Gear ratios of Franklins are: H and D, 3.75 to 1; M and G, 3.71 to 1; G runabout, 3.78 to 1. The front axle is tubular, with Timken roller bearings. The rear wheel bearings are Timken except in the G runabout, which has ball bearings.

Elliptic springs still are Franklin features. On models H, D and M these are 40 by 1 3/4 inches; on the model G touring car they are 36 by 1 1/2 inches. Grease cups at the spring joints furnish lubrication. Steering is of the worm-and-gear type of apparatus and the throttle control works upon a notched quadrant on the steering wheel spider, Fig. 10, instead of having the lever free, as formerly.

There is slight change in wheelbase in the new models. The only notable one is in the model H, in which there is a reduction to 126 inches from the 133 inches employed this year. A comparison of the wheelbases follows:

Model	1911	1912
G-4-13	100	100
G-4-25	103	103
M	108	116
D	123	123
H	133	126

On the model G touring car the tires are 32 by 4 inches, front and rear. On all other models the rear tire equipment is larger than that on the front. Tire sizes are H and D, 36 by 4 1/2 inches and 37 by 5 inches; M, 34 by 4 inches and 34 by 4 1/2 inches; G runabout, 32 by 3 1/2 inches and 32 by 4 inches. Laminated wood sills are still a feature of the bodies.

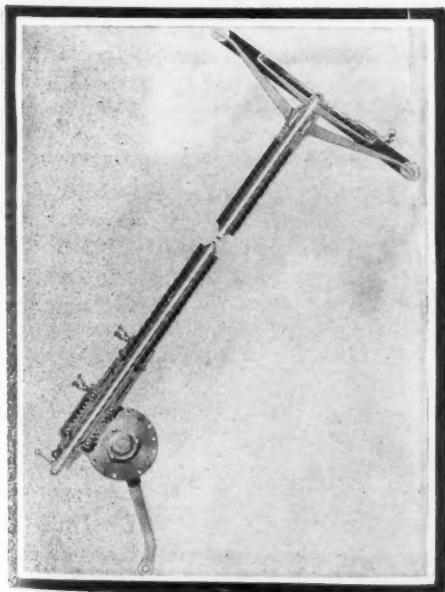


FIG. 10—NEW FRANKLIN STEERING POST
Showing ratchet placed for first time under throttle lever

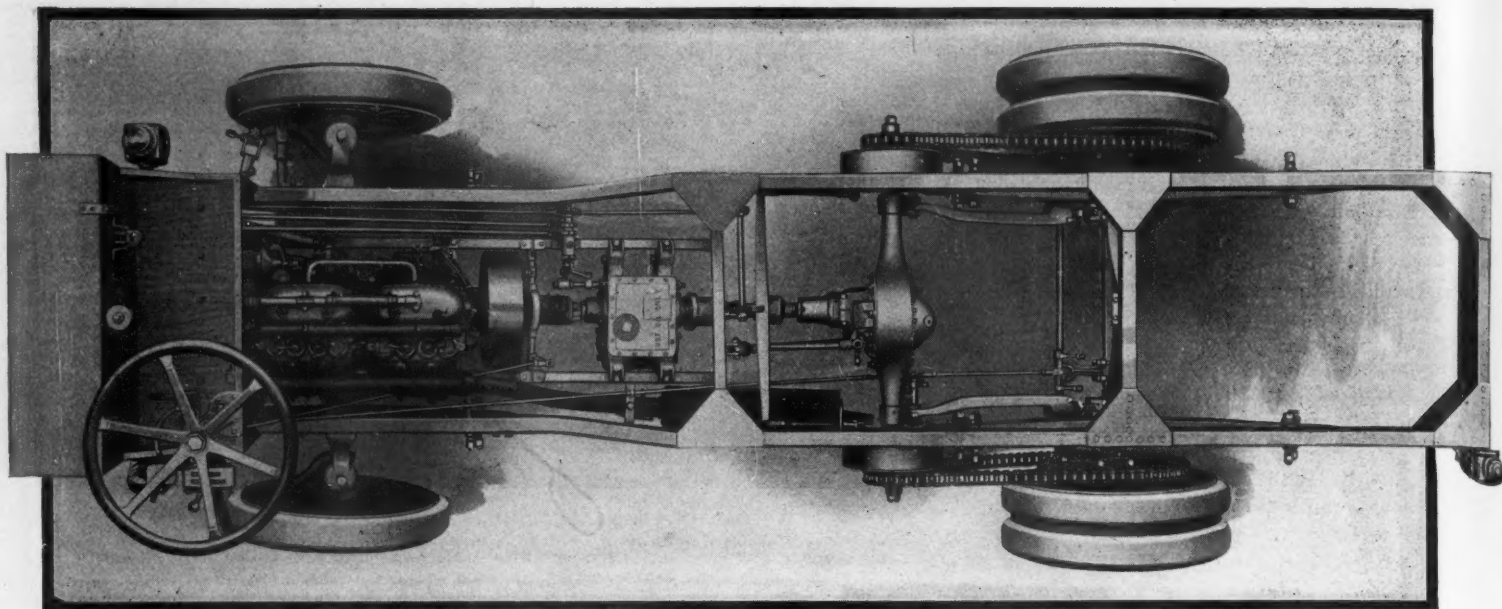


FIG. 1—PLAN VIEW OF CHASSIS OF THE SPEEDWELL 4-TON TRUCK

Speedwell Trucks in Three Chassis Sizes

SPEEDWELL motor trucks, manufactured by the Speedwell Motor Car Co., Dayton, O., are built in three chassis models of 2-ton, 4-ton and 6-ton capacities. The same designing and engineering force that is responsible for the construction of the Speedwell pleasure cars has worked out the design of the Speedwell trucks.

The motor, which is a four-cylinder water-cooled vertical L-type design, is located under the driver's seat and mounted on a subframe with the sliding selective type of transmission gearset. Power from the motor is transmitted to the gearset by means of a simple leather-faced cone clutch; and a short shaft with two universal joints communicates between the gearset and the jackshaft, the latter being nothing more than a cleverly adopted heavy Timken floating type of pleasure car rear axle. Heavy side chains transmit the power from sprockets on the ends of the jackshaft to the larger

Capacities of 2 Tons, 4 Tons and 6 Tons Are Offered in Various Types of Bodies—Motors Are Four-Cylinder, 30 and 50 Horsepower and Differ Only in Size—Left-hand Steer

sprockets on the rear wheel drums. The main frame is of structural steel, channel section; and the subframe is of pressed channel steel. Semi-elliptic springs support the main frame, with an auxiliary cross spring over the rear axle. Both axles are heavy drop-forgings of Timken construction.

The 2-ton truck has a 30-horsepower motor while the 4 and 6-ton trucks have 50-horsepower motors of the same type. The wheelbase of the 2-ton truck is 110 inches, with a loading platform 10 feet long. The wheelbase of the 4-ton is either 115 inches or 139 inches, according to the respective loading platforms desired, 12 feet 6 inches or 15 feet 6 inches. The wheelbase of the 6-ton truck is 139 inches, with a loading platform of 15 feet 6 inches.

Speedwell Constructional Features

Constructional advantages claimed for the Speedwell trucks are, that by having the motor under the seat a loading platform of maximum size may be fitted to a chassis with a short wheelbase with less overhang back of the rear axle—a most desirable advantage in service where the trucks are required to transport bulky but not necessarily heavy articles. It is claimed that Speedwell trucks have the shortest wheelbase for trucks of their capacity, and can for this reason be turned in a shorter space, and be readily handled in traffic and at loading platforms. Because of the little overhang in back, heavy machinery, heavy safes, etc., can be loaded upon the rear

of the platform without overbalancing the truck; and when normally loaded the weight is more evenly distributed upon the front as well as the rear wheels.

Accessibility is a feature of the Speedwell truck design. Fig. 3 shows how the seat is hinged to the chassis and may swing in either direction, making adjustments as easy as in models where the motor is under a hood. At the same time each unit of the car can be taken out without disturbing other units. The motor may be removed without taking off the radiator. By loosening the water connections and two nuts the radiator may be dropped out of the chassis frame. The steering gear also may be easily removed; and the transmission change-gearset can

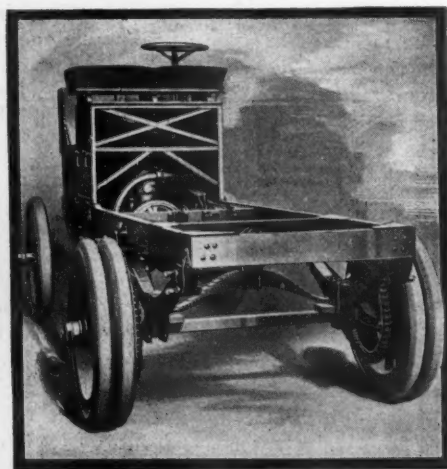


FIG. 2—REAR OF SPEEDWELL



FIG. 3—MOTOR RENDERED ACCESSIBLE

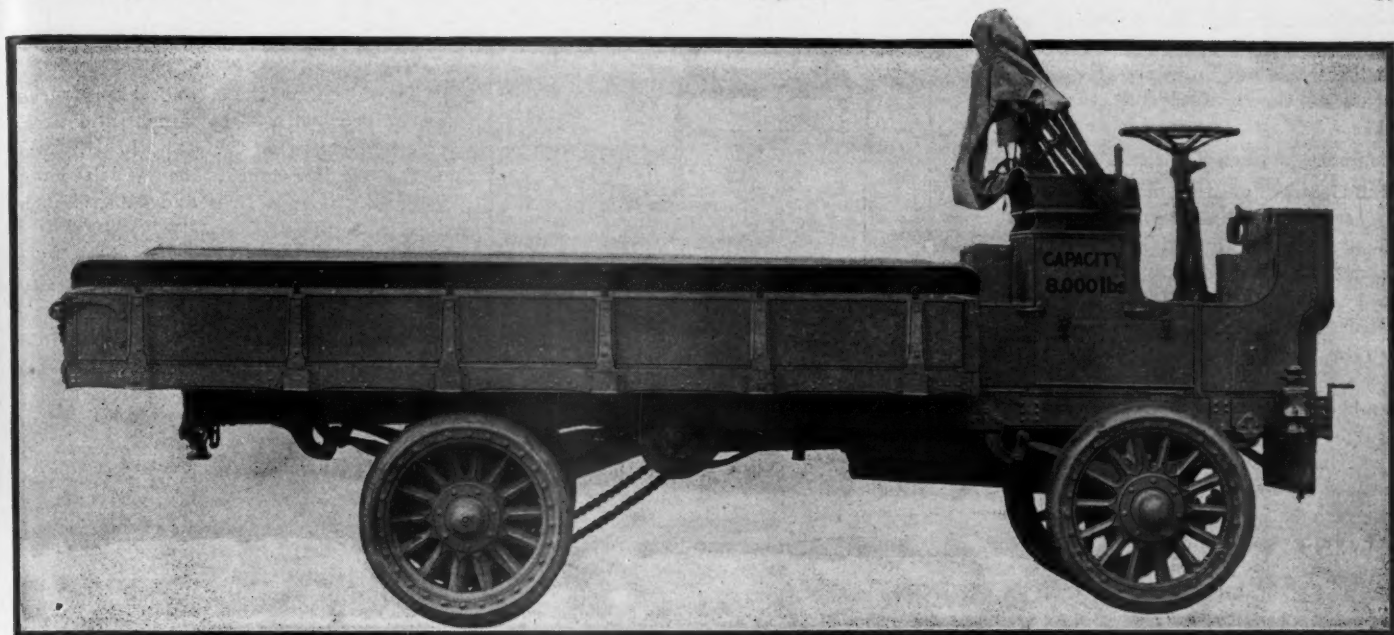


FIG. 4—SIDE VIEW OF SPEEDWELL 4-TON TRUCK WITH EXPRESS BODY

Accessibility of Motor Is Chief Feature

Motors Located Under Seat Which Is Hinged to Chassis—Each Unit of Car May Be Taken Out Without Disturbing Others—Chassis Have Short Wheelbase for Body Capacity

be removed or inspected through an opening in the body platform which normally is covered by a plate.

The motors on all the truck models differ only in size, those rated at 50 horsepower having a bore and stroke of 5 inches, and those rated at 30 horsepower a 4¼-inch bore and 4½-inch stroke. The cylinders are cast in pairs with integral heads, valve chambers and water jackets, but the water-jacket heads are removable for inspection or cleaning of the jackets. All of the valves are of the bevel seated poppet type, located on the left side of

the motor and mechanically operated through adjustable pushrods by a single camshaft inclosed within the crank chamber. Pistons are fitted with four ground eccentric compression rings above the piston pin; and there are oil grooves below the pin provided for the distribution of the oil splashed into the cylinders.

An aluminum crankcase which is divided horizontally into two sections supports the cylinders, and the case itself has four strong legs cast integral with it that are secured to the side rails of the subframe. The lower portion of the

crankcase is itself divided horizontally into upper and lower compartments, the upper one having three transverse partitions that convert it into four splash chambers for the lubricating system, and the lower compartment forms a reservoir for the oil supply. The crankshaft is a drop-forging mounted in three bearings secured to the upper portion of the crankcase, and the connecting rods are I-beam drop-forgings. Bearing caps of the rods are secured by two bolts whose nuts are secured by a special locking device; and the lower half of the crankcase is removable for the purpose of adjusting or inspecting these bearings. For adjusting the bearings, liners or shims made of sheet steel .002 and .004 inch thick, are provided. All bearings are of white bronze.

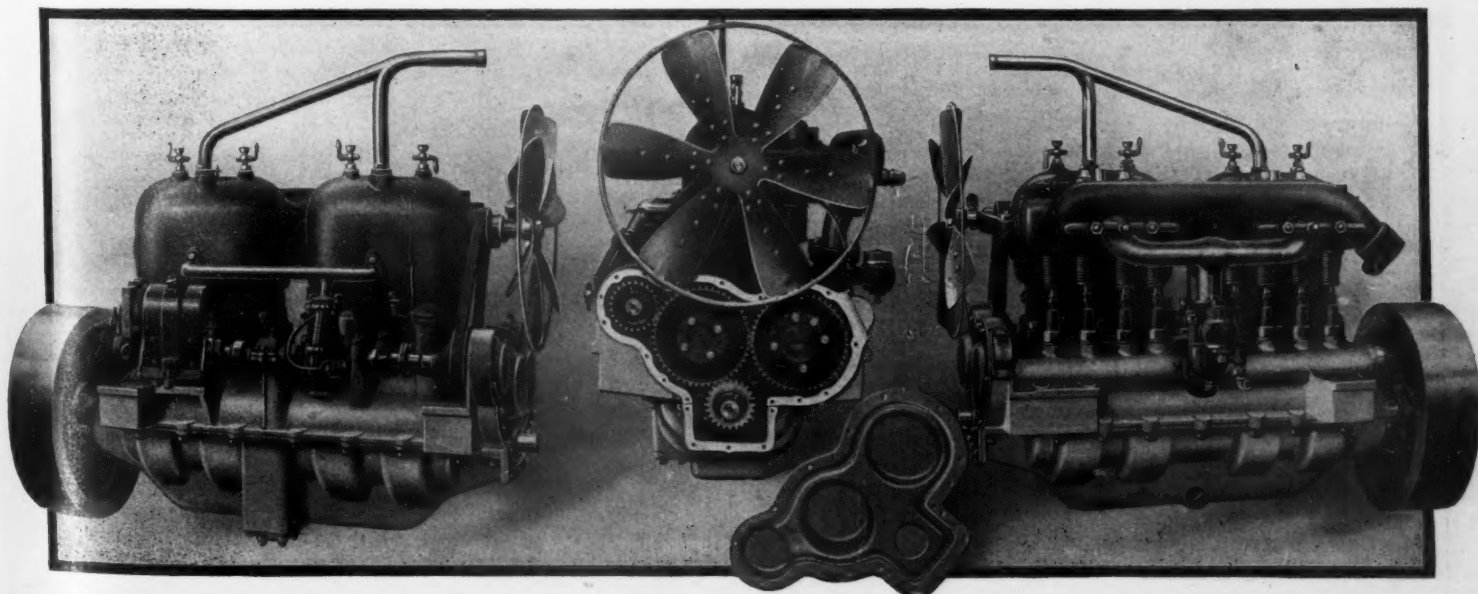


FIG. 5—VIEWS OF MOTOR USED IN SPEEDWELL TRUCKS—NOTE SIMPLICITY AND ACCESSIBILITY OF ITS FEATURES

Helical or spiral engine gears are used, and these also are contained in an integral section of the crankcase at the forward end.

Circulating Splash Lubrication

Lubrication of the motor, as already suggested, is by means of a circulating splash system. The oil is carried in the subbase of the crankcase, from which, on the 4 and 6-ton models, it is pumped by a gear-pump through a sight glass on the dash in front of the driver's seat, then to the upper compartments of the crank-chamber, where it is distributed by splash to all bearings. A constant level is maintained in the splash compartments by an overflow pipe which leads the surplus oil through a strainer back into the subbase reservoir to be again circulated.

Ignition is by means of a single Eise-mann high-tension magneto which requires no batteries for starting and which is provided with an automatic spark advance mechanism that regulates the proper timing of the spark for all motor speeds.

A cellular radiator suspended on double coil springs, a centrifugal water pump, and a belt driven fan are features of the cooling system.

Transmission of Power

The transmission change gearset is comparatively small and compact in design, and gives three forward speeds and reverse. Both shafts are in the same horizontal plane and mounted on annular ball bearings. The universal joints in the shaft communicating between the gearset and jackshaft, are thoroughly inclosed in grease-tight casings. Constructional features of the transmission mechanisms are very clearly shown in the accompanying illustrations. The driving pinion shaft and the differential unit of the jackshaft are mounted on Timken roller bearings, whilst the outer ends of the transverse driving shafts of the jackshaft mechanism are supported in double-

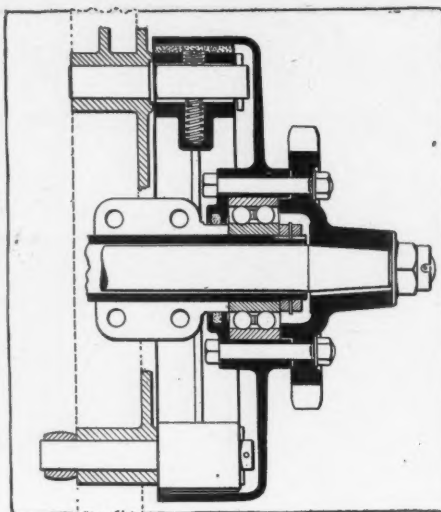


FIG. 6—END OF JACKSHAFT

row annular ball bearings, Fig. 6. This jackshaft is pivoted to the main frame at either side and a triangular torsion rod cushioned between two springs at its forward end relieves the driving chains of considerable starting and stopping strains. All four wheels as well as the steering knuckles are mounted on Timken roller bearings.

All of the Speedwell truck models have two internal-expanding service brakes acting on large drums on the rear wheels. On the 4 and 6-ton trucks there also are two internal expanding brakes acting on drums on the ends of the jackshaft; these are the emergency brakes and are operated by hand levers. The smaller truck has no brakes on the jackshaft but there is an external contracting one at the rear of the transmission gearset case instead.

Control of the car is by means of a differential steering gear with the steering wheel at the left, gear-changing and emergency brake levers in the center and to the right of the driver's seat, service brake and clutch pedals, and a throttle

lever on the steering column under the steering wheel.

The wheels on the 4 and 6-ton trucks are equipped with 36 by 5-inch solid tires, duals being used on the rear wheels; while on the smaller truck, the wheels have 34 by 4-inch front tires and 34 by 3-inch duals in the rear.

MOTOR CAR LITERATURE

The 1912 Thomas cars are graphically described in a catalogue entitled "The Story of the Thomas." The story is told in conversational style, the characters being the factory manager, a Thomas owner and his chauffeur who make an inspection tour through the factory.

The Penn Motor Car Co., Pittsburgh, Pa., has issued an advance booklet with specifications telling of its 1912 line of Penn cars.

The Bureau of Manufacturers, Washington, D. C., has recently issued a booklet containing information of value to American manufacturers and exporters regarding Australia, its resources, industries, trade conditions, etc.

The Waverley 1912 line of electrics is most attractively featured in a catalog, the decorative designs of which are taken from characters and scenes associated with Abbotsford. The cover design in green and gold displays figures in medieval armor at the entrance hall of Abbotsford, and across the top of each page is a frieze in three colors and gold representing the tournament in Ivanhoe. Exterior and interior views of the Waverley cars are portrayed, supplemented with the usual car specifications and other information.

"The Goodrich" is the name of a new publication, which recently made its debut in the motor world at the factory of the B. F. Goodrich Co., Akron, O. In this its initial issue, the life history of the Goodrich plants is related.

The Kline Motor Car Co., York, Pa., are mailing to the trade an advance announcement of its 1912 line of Klinecars. Specifications are given. No illustrations.

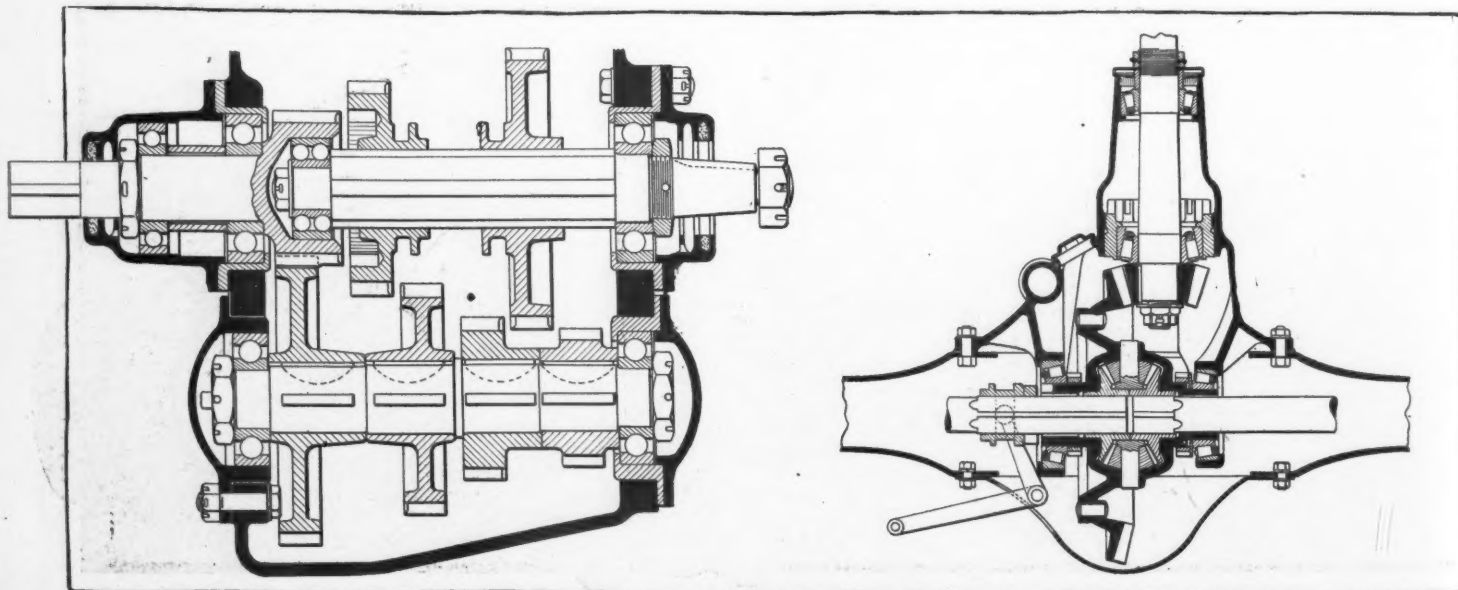


FIG. 7—SECTIONAL PLAN VIEWS OF SPEEDWELL TRUCK GEARSET AND JACKSHAFT MECHANISMS

The Realm of the Commercial Car



MAKERS of commercial vehicles and dealers of these vehicles should give more attention to the problem of speed. Trucks are sold to average 15 miles per hour, when, as a matter of fact, they cannot average 10 miles per hour in congested districts. On this page are printed the actual performances of the trucks and delivery wagons in the recent commercial vehicle demonstration of the Chicago Motor Club, held in Chicago and suburbs. Three tables of time performance, which are the official figures of the test, tell the story. The first set of figures designated column 1 are of a forenoon run from Wabash avenue and Twenty-sixth street, out Cottage Grove avenue to Pullman, and thence over country roads to Chicago Heights, a distance of 30 miles. Some stretches of the roads were bad, some of the biggest trucks stalling in the mud. This table shows that for trucks up to 1-ton capacity the speeds averaged around 15 miles per hour. For 3-ton vehicles the speeds were around 10 miles per hour, and for 5- and 7-ton trucks it dropped to 6, 7 and 8 miles per hour. These figures are a great deal lower than what many of the truck salesmen talk when making sales. The congestion was not a factor in this run, because the big trucks got away before 6 in the morning, when the streets were practically empty. Some of their averages were cut down by the mud.

With the smaller vehicles there was not any time lost due to being held up by traffic, but it must be said that they were not started until after 8 o'clock, when the streets were well filled with teams. Not one of them had to go through the down-town business section, so that real traffic was not encountered. From these speeds it is quite apparent that 15 miles per hour is a big average for a light delivery wagon, which in this case went

Speed of Motor Trucks

30 miles without having to make any stops to deliver or take on goods.

Columns 2 and 3 show these same trucks on another day when operating entirely within the business section of Chicago and its nearest suburbs, Evanston and Oak Park. At a glance it will be seen that the average speed of No. 1 is cut from 15.5 miles per hour for suburban work in column 1 to 12.5 miles per hour for city work in column 2. This is a reduction of 3 miles per hour. On No. 2 there is a cut of 4 miles per hour in the running performance. All along the line there is a reduction of 3 or 4 miles per hour on the trucks of capacity up to 1 ton. Looking at the 3-, 5- and 7-ton trucks, their running schedule is as high in the city delivery work as it was in the suburban work. This is a peculiar situation, and is explained as follows: The speed of the big trucks approximates the average speed of traffic in the conges-

tion zones of the city, whereas the speed of the lighter vehicles is ordinarily faster than the city traffic, but in actual service these little vehicles are held back considerably by the slower traffic. This suggests a condition that was observed all through the demonstration in city traffic, namely that horse teams will get out of the way of the big 5- and 7-ton trucks much quicker than they will for the little 1,000-pound or 1-ton trucks. Here is where the big truck actually gains in city work over the lighter vehicles.

The delivery salesman must remember that if his vehicle is to be used in zones of traffic that its actual speed will be from 4 to 5 miles per hour lower than the speeds it can make in zones where the traffic congestion does not hold it back. Buyers of such vehicles should remember this also. The salesman of the big truck has an advantage in traffic circles and hence can bring out the advantages of his machines for work in the centers of big cities where traffic is greatest. A study of these tables will produce much of real value to all interested in motor truck business:

CHICAGO'S MOTOR BUSES

Two of the four motor buses recently put in service between the Northwestern railroad station and the center of the shopping district of Chicago are shown in the illustration. It is found that the four motor buses transport the passengers with greater dispatch than did the thirteen horse-drawn vehicles. The fare charged is 10 cents, quite a reduction from the 50 cents charged before. The White Co., of Cleveland, is supplying the chassis for the new motor buses and the bodies are built by H. McFarlane & Co., of Chicago. Eighteen passengers may be accommodated, and the interior of the cars is lighted with electricity, supplied with electric fans for use in summer. The cars have side entrances.

No. Truck.	Load carried.	Col. 1 M.P.H.	Col. 2 M.P.H.	Col. 3 M.P.H.
1—Mercury	1040	15.5	14.48	12.56
2—Mercury	1050	15.24	15.14	11.42
3—Clark	1595	10.68	13.40	11.39
4—Buick	1780	15.24	14.17	13.25
5—Sampson	1505	14.52	14.05	12.62
6—McIntyre	1395	13.38	13.14	11.42
7—Crown	1655	14.94	13.32	11.88
8—Krickworth	1717	12.86	13.14	11.88
9—Clark	2100	14.22	13.70	12.27
10—Clark	2120	14.82	13.60	12.82
11—LeMoon	2080	16.62	15.35	13.25
12—Little Giant	2080	15.24	13.40	12.44
14—Adams	2075	15.06	13.87	12.74
16—Lauth-Juergens	2100	15.5	13.16	12.92
17—Lauth-Juergens	2120	15.72	12.59	11.88
18—Decatur	2050	17.52	15.63	13.45
20—Chase	2070	12.18	13.16	11.67
22—Stegeman	4270	13.08	12.07	10.60
23—Reliance	4145	11.64	8.59	11.66
24—Mals	5115	9.42	10.91	11.94
25—Alco	7155	10.50	14.17	9.08
26—Old Reliable	7190	7.63	14.29	11.94
27—Durable Dayton	6060	10.08	10.09	9.29
28—Pope-Hartford	6110	10.38	12.43	11.62
29—Saurer	9140	10.20	13.60	11.18
30—Stegeman	8125	7.68	8.93	7.74
31—Sampson	10100	8.58	9.17	8.92
33—Saurer	13145	5.58	8.59

From the Four Winds



HOW ANCIENT CARS END THEIR DAYS IN FRANCE

Just as wornout horses are degraded from their original glory as coach animals to become drudges, so what were once the aristocrats of motordom become humble instruments of commerce. The car illustrated is an early Renault with deDion single-cylinder motor, which is earning its keep on the streets of Paris in the service of a chair repairman and daily carries its load of broken-down furniture from house to house

NO Philadelphia Run—The reliability run of the Quaker City Motor Club, scheduled for November 2, 3 and 4, has been called off.

To Change Speed Laws—Montreal motorists have begun a campaign to increase the rate of speed permitted for travel through the city. The present limit is 9 miles an hour.

Club Changes Name—At a special meeting of the Automobile Association of York, Pa., the name of the club was changed to the York Motor Club. The association also decided to become a member of the Pennsylvania Motor Federation and the American Automobile Association.

Chalmers Convention Continued—The Chalmers technical convention at Detroit, which was continued last week with twenty-eight technical men from the middle west and south in attendance, is proving so popular that the company has decided to all a fourth week to the convention program. Accordingly the sessions will not end until the week of November 6.

Ohio Mudhen in Utah—From Salt Lake City comes the latest news of the round-trip transcontinentalists and the veteran good roads car, the Ohio Mudhen. Like a ship on the ocean, lost to view for many days, and then heard of through some unusual report, is the Mudhen and its crew. Thomas W. Wilby, United States good roads commissioner, who, with his wife and Fred D. Clarke, the veteran coast-to-coast pilot, comprise the crew. Out beyond Cheyenne the Mudhen and its passengers climbed to the summit of a

mountain marked by the Sherman monument, and which forms the highest point reached by the Union Pacific railroad, 8,010 feet above the sea.

United States Motors Cuts Melon—The United States Motor Co., New York, has issued its quarterly dividend, October 18, of 1¼ per cent, which will be paid November 10, 1911, to holders of the preferred stock of record at the close of business October 31.

Reduced Freight Rates for Savannah—President Harvey Granger of the Savannah Automobile Club has been advised by E. R. Richardson, freight traffic manager of the Ocean Steamship Co., that the rate of 57 cents a 100 pounds would be granted for motor cars for the races or 57 cents a 100 pounds for single cars, the minimum weight of 2,500 pounds and less than car load whether crated or not; knocked down cars boxed or crated less than a car load get the rate of 43 cents a 100 pounds. Car load lots of not less than 10,000 pounds get the rate of 28½ cents a 100 pounds.

Ranchers Restrict Loads—The ranchers of Polk County, Ore., have adopted a novel way whereby they mean to save the roads. The farmers advocated restricting loads being drawn over the best roads which exceed a certain weight, and the county court was appealed to for assistance in the matter. As a result the Polk county court has recently placed legal restrictions on the size of the loads that may be carried over certain prescribed thoroughfares. Hereafter it will be unlawful in Polk County to haul over 3,500 pounds on wagons with tires less than 4 inches wide,

or 4,500 pounds on vehicles with tires between 4 and 6 inches wide, the weight of the wagon being considered as part of the load.

Two Weeks' Show at St. Louis—Dates have been decided upon for the sixth annual show at St. Louis. This is to be held in the Coliseum, as last year, and will run for 2 weeks. The first week will be devoted to an exhibit of pleasure cars, and the second to commercial vehicles. The dates are: Pleasure car exhibit, February 5 to 10; commercial exhibit, February 12 to 17. F. W. Payne is manager.

Sioux City Plans Run—The Sioux City Automobile Club is considering a plan for an endurance run. The contest as planned will be a 3-day endurance contest of about 500 miles in length. The proposed route is east to Correctionville, thence north to Cherokee and Sibley, then to Rock Rapids, and into South Dakota, the first night control being at Sioux Falls. The run will be held over roads not traveled greatly by motorists, being thus more of a test of the cars, and at the same time being a further boost for good roads.

Copper County Club Election—At a meeting of the newly organized Copper County Automobile Club, at Calumet, Mich., the following officers were elected: President, R. S. Sheldon, Houghton; vice-president, Fred S. Eaton, Calumet; secretary and treasurer, W. D. Calveley, Houghton. The board of managers comprises the officers and John Vivian of Calumet, J. L. Harris of Hancock, H. S. Goodell of Painsville and A. F. Heidkamp of Lake Linden. The managers will name a number of honorary vice-presidents in parts of the copper county and these men will be expected to work in the interest of good roads in their section.

Has Pipe Organ on Car—Perry Cozatt, of Danville, Ill., has a pipe organ attached to his touring car. He has applied for patents. The organ is a miniature of one which was built by Cozatt some years ago, and is in service at his home. This motor organ has a smooth, mellow tone, yet is sufficiently loud as to be audible for some blocks. It covers two octaves, from middle C up. There are twenty-four pipes connected with a small bellows pumped by a friction drive and a belt. When touring the country, Cozatt, who is organist of Holy Trinity church at Danville, can keep in practice. Just back of the driver's seat there is a music rack. While moving at full speed the organist can render almost any composition possible upon a large instrument. Block tin pipes carry the air from the bellows to the pipes, which are bolted to the running board on the car. The keyboard is at one side and beneath the steering

wheel. Cozatt, after setting his wheel, can discourse sweet music while bowling along the country roads.

Wisconsin Registration Date Changed—The secretary of state of Wisconsin has announced that applications for 1912 registrations and licenses will not be received before December 15, instead of December 1, as previously stated. Annual registration went into force on September 1 in Wisconsin, and all cars will have to be registered by January 1.

Newark's Show for February—Arrangements have been completed for Newark's fifth annual show to be held in the First Regiment Armory, February 17 to 24, 1912, inclusive. The Newark show has, ever since its inauguration, had the week of Washington's birthday, and it has been decided to follow this custom for 1912.

To Give Patrols Right of Way—The crew of the new municipal motor ambulance of Wilmington, Del., is complaining about teamsters not giving the machine the right of way, which is also causing trouble for the police patrol service. As a result, the police commissioners had a conference today, at which they decided to make an effort to have the police regulate the street traffic.

Truck Periodical Changes Hands—H. F. Donaldson has sold his interest in the Commercial Vehicle to the United Publishers Corporation, and has tendered his resignation as president and editor of that publication. Donaldson intends to join the S. A. E. party sailing for England November 1, and while abroad will investigate commercial vehicle conditions in Europe.

Car Trims Lawn—The general idea in the motor world seems to be that for draught work one needs a specially built car or truck. It is interesting to note, therefore, that the Holy Cross cemetery, San Francisco, has found a unique use for its Cole 30 roadster. This cemetery keeps its lawns trimmed with a large horse mower, which formerly kept eight horses busy. The Cole car is now hitched to the mower, however, and is doing the work of the entire eight horses. It is also found that a car is less injurious to the lawn than were the hoofs of the eight horses.

Jones Quits Racing—William L. Jones, member of the racing team of the J. I. Case Threshing Machine Co., of Racine, Wis., and participant in many track, speedway and road events during the last 2 years, has resigned and on November 1 entered the more sedate life of an insurance man. Jones will have charge of the motor car insurance department of a Chicago general insurance agency. When the late Lewis Strang took charge of the contest interests of the Case company, he picked Jones, then a traveling representative for the Racine interests, as member of the racing team. Jones drove a Case car in the Memorial

Day 500-mile event at Indianapolis, with Strang and Jagersburger. He is best known as a reliability tour driver.

Terre Haute Association Organized—Under the voluntary association act, and without capital stock, the Terre Haute Automobile Association of Terre Haute, Ind., has been incorporated. The organization is a social motor club. Incorporators are S. F. Lane, Charles Patton, H. H. Dronberger, M. A. Steele, F. F. Blankenbaker, J. F. Lynch, H. E. Bindley, J. G. Elder, C. B. Goroy, G. R. Daniels, J. R. Yun, E. R. Baldridge, Carl Bauermeister, T. O. Beggs and C. J. Root.

Headlights Bill Defeated—Efforts to secure the adoption of a city ordinance in Detroit to provide for the screening of high-powered motor car headlights have been defeated through the influence of the Wolverine Automobile Club. The ordinance committee of the common council reported adversely on the measure last week, and, while its sponsor succeeded in having it referred back to the committee for further consideration, the probabilities are that it will die a natural death. Members of the club contended that it would be impracticable to screen the lights, and that more damage would result from the use of screens than from the dazzling glare of the headlights.

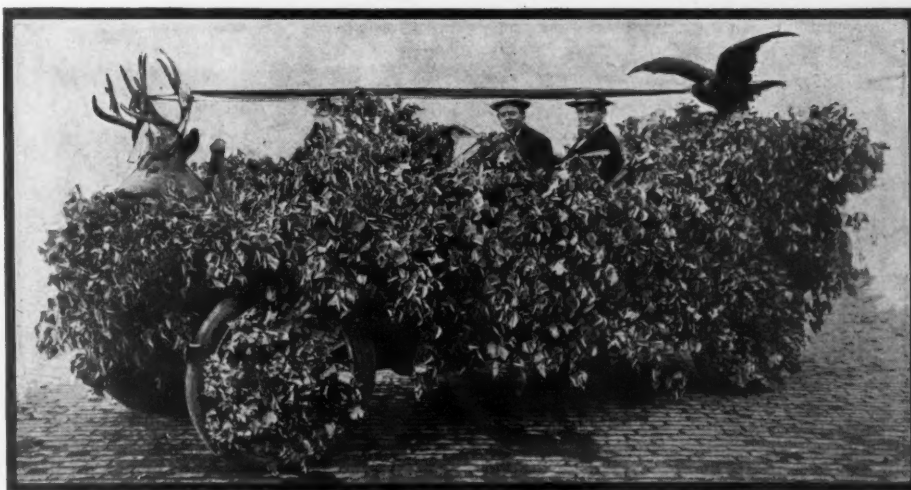
Over Snoqualmie Pass—Snoqualmie Pass, in the western part of the state of Washington, has been successfully negotiated. This means that a motor car, traveling on its own power on low gear, covered the 32 miles of heretofore impassable near-roads in the Cascade mountains. J. A. Stoner, of Spokane, Wash., who is credited with the feat, was accompanied on the trip from Seattle to Spokane, 400 miles, by W. E. Bayless, of Seattle, and R. D. Maxwell. The trip occupied 6 days, and 34½ gallons of gasoline was consumed. The car damage consisted of a worn-out tire, a blow-out, a broken spring and twisted steering rod. No mechanical trouble of any kind resulted. The

trip was made in a Warren-Detroit touring car as a test.

Seven Races at Sioux Falls—Motor races will be held in Sioux Falls, S. D., Thursday and Friday. Five hundred dollars in purses besides seven silver cups have been offered for the winners of the different events. The first day there will be three races, one each in the 20, 30 and 40-horsepower classes. On the second day there will be four, including a free-for-all. It is expected that there will be twenty-five entries.

Speed Limit Raised—The Automobile Club of Southern California announced the raising of the speed limit in the city of Claremont, Cal., the past week, from 12 to 15 and 20 miles an hour. This was received by the southern California motorists with joy, as the college town has been avoided of late because of the drastic measures said to have been taken against autoists who exceeded the speed limit a fraction. The raising of the limit is due to the efforts of the officials of the club, who have been working for months with the Claremont officials.

Easy Contest Conditions—Owing to the complaints of southern amateur owners who took part in the recent Glidden tour, the promoters of the Tour-Around-Georgia, which will be run to the Savannah races, have announced most extremely liberal running conditions for their event. The top speed required will be but 18 miles an hour. It is also provided that the contestants will be allowed to run right along, without using the hour allowed for the noon control. They will also be allowed to make repairs on their cars on their own time, which will make it possible to eliminate most of the rush repairing on the road that takes time and makes fast running necessary. Nearly forty cars have already been entered for the Tour-Around-Georgia. The latest entries were for the three Flanders machines that formed the factory team in the Glidden tour.



PRIZE WINNER AT HORSE SHOW

G. M. Porter in his National 40 decorated for the Homer, Ill., horse show and carnival. While the show was not a stag affair, the award of first prize to this method of decoration indicates a leaning in that direction.

Current Motor Car Patents

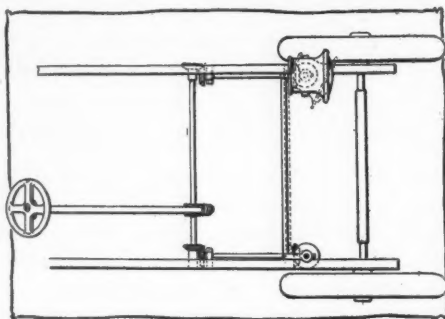
FARREL Dirigible Head Light—No. 1,005,626, dated October 10; to Arthur James Farrel, Pittsburg, Pa.—This patent relates to a means of rendering the head lights of a motor car dirigible. It comprises a worm on the post of the steering gear, two vertical lamp supporting shafts, journals and bearings carried by the side frames of the vehicle, a bevel pinion on the lower end of each shaft, a pair of horizontally extending shafts, journaled in hangers carried by the side frames, beveled pinions on the forward ends of these shafts and meshing with the pinions on the lower ends of the vertical shafts, beveled pinions on the rear ends of these shafts, a transversely extending shaft journaled in the hangers carried by the side frames and provided with beveled pinions meshing with the pinions on the rear ends of the horizontally extending shafts, a worm wheel on the transverse shaft meshing with the worm on the steering post, rearwardly extending cranks carried by the vertical shafts and a connecting bar pivotally attached at its ends to these cranks. This device is shown in one of the illustrations at the bottom of the page.

Weiland Carbureter—No. 1,005,491, dated October 10; to Alfred Weiland, Philadelphia, Pa.—The carbureter to which this patent relates comprises a main reservoir, a mixing chamber adjacent thereto, a fluid inlet to the reservoir, a mixture outlet from the mixing chamber, a throttle valve, an auxiliary reservoir having communication with the main reservoir and the mixing chamber, a main air valve, means to supply a mixture of air and fluid to the mixture outlet when the main air valve is closed, and means to simultaneously control the

Ideas of the Inventors

throttle valve and air valve as illustrated herewith.

Pierce Carbureter—No. 1,005,300, dated October 10; to Burton Neulon Pierce, Indianapolis, Ind.—This patent relates to a carbureter having a mixing chamber with a main air inlet at one end and a gas outlet at the other end, a spring held wing valve in and extending transversely of the mixing chamber with the lower part thereof cut away to form a normal passage way thereunder for a current of air from the main air inlet, a fuel inlet entering the



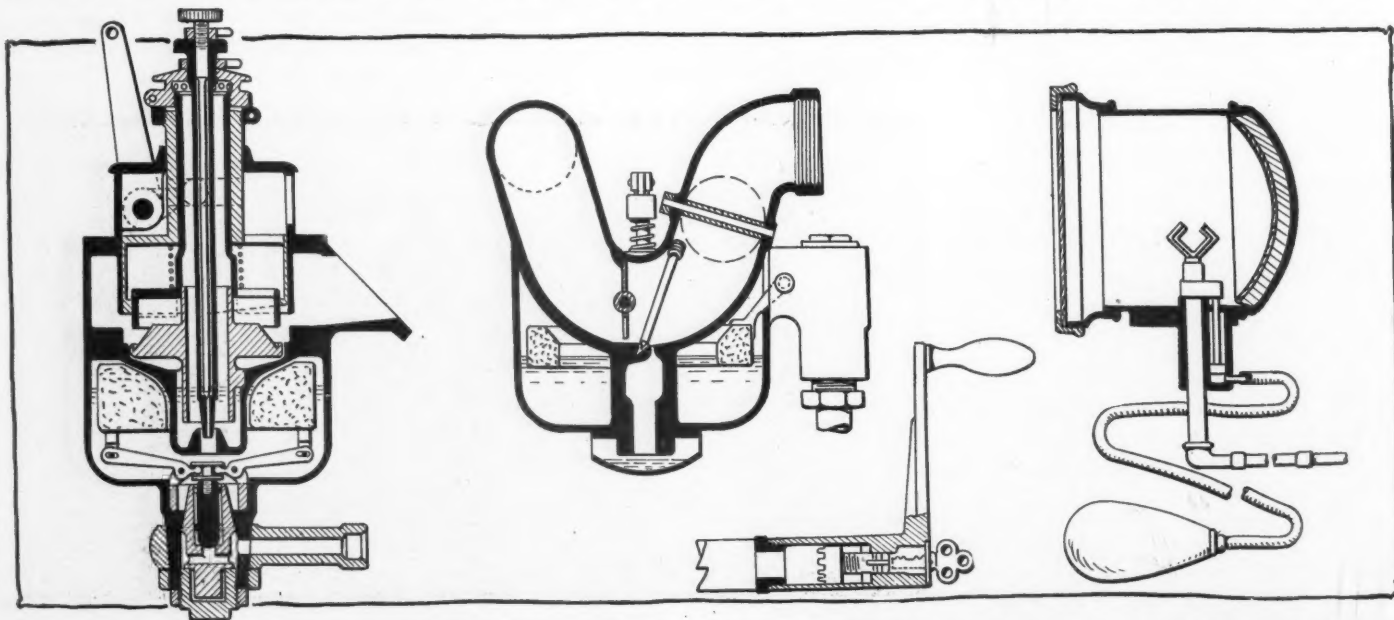
FARREL DIRIGIBLE HEADLIGHT
Headlights designed to be turned with front wheels of the car

mixing chamber at the bottom thereof immediately behind the wing valve, a secondary air inlet in the bottom thereof, and a secondary inlet in the bottom of the mixing chamber that is located immediately behind the fuel inlet, and a needle valve extending through the top of the casing of the mixing chamber down slantingly through the mixing chamber to the fuel inlet. This is illustrated below.

Armbruster Starting Crank Lock—No. 1,005,496, dated October 10; to John C. Armbruster, Minneapolis, Minn.—This patent pertains to a means of locking the starting crank of a motor car so that it cannot be used to start the engine when locked. It is a combination with a starting crank provided with a hub of a shaft rotatively mounted in the projected end of the hub and provided within the hub with a coupling clutch member and provided outside of the hub with a clutch for connection to the crankshaft of the engine or an engine driven shaft, a second coupling clutch member held for rotation but mounted for sliding movement within the crank hub to connect and disconnect the shaft to the hub, and a key actuated means for moving the sliding clutch member as shown.

Greenlaw Lamp-dimming Device—No. 1,005,197, dated October 10 to Warren A. Greenlaw, Melrose, Mass.—This patent covers a means of dimming the headlights of a motor car so that they will not affect the eyes of the drivers of on-coming vehicles. It is a combination in a lamp with a reflector, of a radial extension to the casing of the lamp provided with an opening thereto and a chamber parallel to the opening; a burner slidably mounted in this opening, a piston movable in the chamber, a connection between the piston and burner, and means under control of the operator for moving the piston to throw the burner out of focus with the reflector.

In the arrangement shown in the illustration the burner of the lamp is thrown out of focus with the reflector by means of a jet of air from a bulb.



WEILAND CARBURETER
Both air valve and throttle valve are controlled simultaneously

PIERCE CARBURETER
The chamber for mixing gas and air is in the form of a U tube

LOCK FOR STARTING CRANK
Device for locking starting crank of a motor car

LAMP-DIMMING DEVICE
Greenlaw design to temporarily dim motor car headlights



Development Briefs

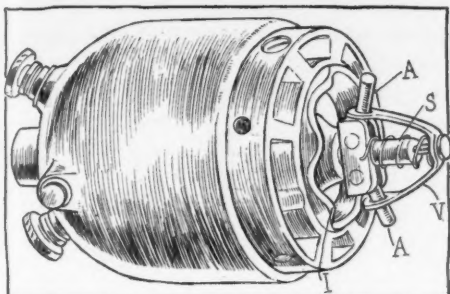
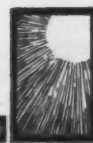


FIG. 1—MECHANISM OF TYPHOON HORN

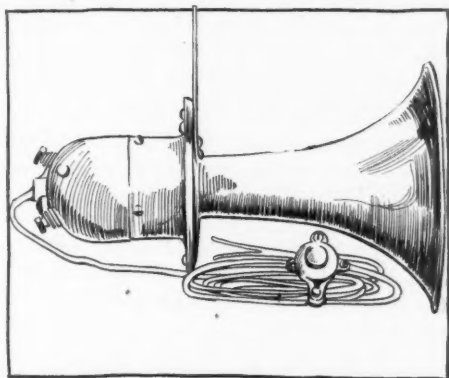


FIG. 2—STANDARD STYLE C TYPHOON

Typhoon Electric Horn

IN Fig. 2 is illustrated the standard style C type of Typhoon electric signal made by the Typhoon Signal Co., Chicago. The projector is brazed onto a heavy drawn brass casing that houses the steel diaphragm. To this casing is attached a heavy brass bracket which is interchangeable and can be attached to either side of the car. In the end of the casing is installed the motor which revolves the shaft. Upon this are pivoted two arms AA, Fig. 1, which are normally inclined forward by the spring S through the V-shaped sleeve V.

As the motor speeds up, the arms take a vertical position due to the action of centrifugal force, and strike the interrupters I as they revolve, causing the peculiar sound. The spring could be done away with but is added to cushion the arms and relieve them from excessive wear. Tests at the factory have shown that the horn uses $1\frac{1}{2}$ amperes of current in operation.

Special attention has been paid to the lubrication of the motor. Two separate oil holes are provided and are closed with screws to prevent the entrance of dust. The signal is designed to operate on six or eight dry cells or a six or eight-volt storage battery. A specially designed set of cable terminals are supplied. These are made to slip on the contact screws of the motor and are protected by a tube of hard rubber.

Novelties for the Car

A combination steering wheel and foot push button has been originated for use with the horn. The button has a metal strap attached for use on the steering gear. If the strap is detached the push button can then be screwed into the footboard and operated by means of a touch of the foot.

Celluloid Wind Shield

In order to provide a windshield that will fulfill the three conditions of deflecting the wind in such a way that it will not cause a draft on the back of the heads of the occupants of the front seat, that is without rattle, and, lastly, that offers no danger from broken glass, there has been placed on the market a celluloid shield of original shape. The shield is illustrated in Fig. 3 and is manufactured by the Empire Top and Windshield Co., of Boston, Mass.

It is said to be lighter than shields made of glass in the usual way, as well as offering less chance of breakage on rough roads. The curved front is designed to direct the wind over the heads of the passengers and driver, while not obstructing the view of the road. Should the celluloid become broken or discolored, a new panel may be obtained at a nominal cost from the manufacturers.

The shields are made in sizes to fit all cars, and can be attached to any form of dash by simply cutting out the filler board to fit. By means of telescopic stayrods the shield can be adjusted to any height desired, and can be thrown forward to accommodate one in entering or leaving the front seat.

Combination Lock Switch

Ignition switch locks are not a new thing, and as they are a boon to motorists in preventing theft of the car and joy-riding, have come into extensive use, particularly on the more expensive makes of motor cars. The most of these have one drawback, and that is the necessity of carrying a key. A lock switch in which this difficulty is overcome is made by A. W. Methven, of Pontiac, Mich. Instead of a key, the lock is operated by a combination, as illustrated in Fig. 4.

It is impossible to turn the switch without the combination being set. After the combination has been set, the switch turns very easily to either battery or magneto. The locking device has over 1,000 combinations. It is possible to set any switch at any of the 1,000 combinations, and, as in the case of a lock, it can be readjusted to any of these, as desired. The switch is said to be no larger than the smallest switch now in use, is very neat in appear-

ance and is one of the sure ways of stopping thieves and joy-riders. The question of the prevention of theft of the car is becoming a serious one, whether it be the temporary unauthorized use by chauffeur or repairman, or actual appropriation by thieves.

English Hose Nozzle

Where the hose used for filling the radiator is equipped with the ordinary hand tap, the latter is constantly becoming damaged by being dropped on the cement floor and the general rough usage that falls to its lot. In a nozzle brought out by E. J. Guest, of Smethwick, England, the protruding tap handle is done away with and replaced by two plates that extend backward from the nozzle, one on each side of the central pipe. These plates are much like the handles of a pair of pliers and are operated in the same way. When the plates are squeezed together a central valve which controls the flow of water is withdrawn and water allowed to flow. The moment pressure is released the flow is stopped, and should the nozzle be dropped no damage will result, as the latter is provided with rubber buffing rings.

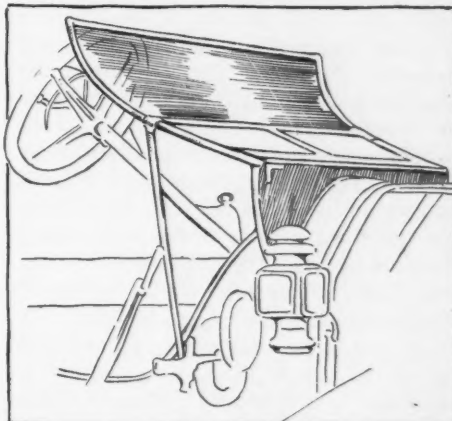


FIG. 3—EMPIRE CELLULOID WINDSHIELD

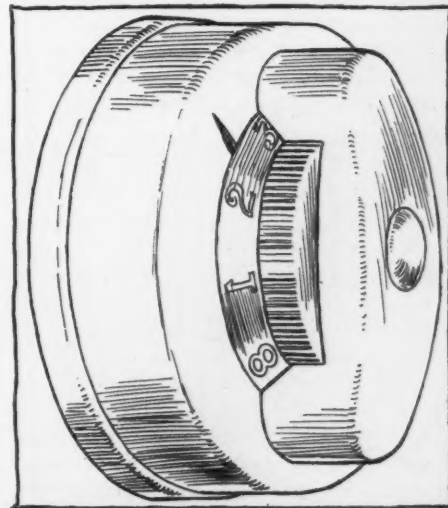
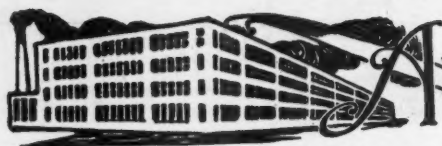
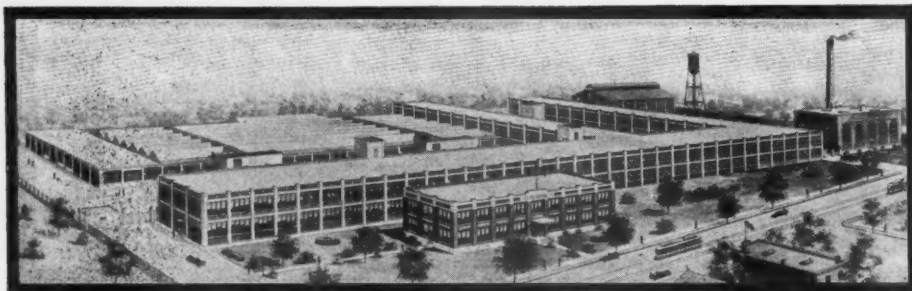


FIG. 4—COMBINATION SWITCH LOCK



Among the Makers and Dealers



The Detroit works of the Lozier Motor Co. This plant is constructed of reinforced concrete and 1,100 men are employed in it. All of the equipment is new, none of the machinery being over 1 year old. The Detroit plant is the main factory where all the Lozier Motor cars are completed, another plant at Plattsburg acting as the feeder

CONTINENTAL Enlarges Plant — The Continental Motor Mfg. Co. has begun work on an addition to its Muskegon plant. The extra room is greatly needed. The plant is now running full capacity, night and day.

New Dorris Location—The Dorris Motor Car Company is to erect its proposed building at the southwest corner of Laclede avenue and Sarah street, St. Louis. It will be of brick and reinforced concrete.

Truck Builder Reorganizes—A reorganization of the Whitesides Commercial Car Co., which is moving from Franklin, Ind., to Newcastle, Ind., has taken place, the new company being incorporated with an authorized capitalization of \$31,250. Among the directors is L. C. Boyd, president of the Indianapolis Water Co. Other directors are F. N. Whitesides, O. C. Saffell, T. B. Milliken and W. G. Hillock.

Builds Factory in Virginia—Ground has been broken for the automobile factory which the Kline Motor Car Co. is to erect in Richmond, Va. The contract calls for a completed structure by February 1, 1912. The plant will cost about \$300,000 and will give employment to about 1,000 men when in full operation. It is said that orders have already been received for cars valued at \$800,000, though no deliveries can be made until next year.

Buick Extension in Canada—The McLaughlin Carriage Co., of Oshawa, Ont., sole concessionaire for the Buick line in Canada, has entered on a building campaign in western Canada. It already has a big branch at Winnipeg, and the company has decided to greatly widen its field in the west by the erection of new branches at Regina, Calgary, Edmonton and Saskatoon. Each of these branches will be equipped to take care of the motor car and carriage business of the company, and are all of the same style and about equal in size, being erected on lots of 100 by 115 feet on main thoroughfares, with ample

space for further enlargements. The construction is brick and steel, with concrete floors and truss span roofs, so that there are no pillars to interfere with the floor space. The Regina branch will be under the general management of W. G. Parsons.

Hupp Has New Manager—The Hupp Motor Car Co. has appointed Charles D. Hastings as its new general manager. Hastings is given a large share of the credit for the successful development of the Hupp sales organization, and his suggestions have resulted in many economies in the manufacturing end of the business. For several years before he became identified with the Hupp Co., Hastings was with the Olds Motor Works.

Briscoe Resigns as President—Frank Briscoe, who has been at the head of the Detroit division of the United States Motor Co. since the corporation was organized, has gone to New York to take full charge of the company's engineering work. This necessitated his resignation as president of the Briscoe Mfg. Co. and the Brush Runabout Co., and as treasurer of the Alden-Sampson Co., and it is announced that the plants will be operated as units hereafter.

Moves to Wisconsin—The Lavigne Gear Co., of Detroit, Mich., has decided to move to Wisconsin, and the equipment and machinery are now being installed in buildings of the Wisconsin Engine Co. at Corliss, Wis., 25 miles south of Milwaukee. The company has been incorporated under the laws of Wisconsin with an authorized capitalization of \$100,000 by Charles E. Albright, George Uihlein and Norman L. Baker, of Milwaukee. The concern manufactures gears for motor vehicles, and as a specialty makes a gear which is a substitute for the worm gear and adapted especially for use on trucks and commercial cars. The first delivery from the Corliss works will be made November 1. About 174 men are employed at this time. The monthly output

is 2,500 gears, but this will be increased to 5,000.

Kissel Plant Enlarged—The new factory building of the Kissel Motor Car Co., at Hartford, Wis., in which most of the assembling will be done, will be ready for occupancy about December 1. The additional room is needed to enable the concern to keep up to the 1912 schedule.

Flanders Strike Over—After being on strike about a week, the brass and iron molders and coremakers employed in the plant of the Flanders Mfg. Co., in Pontiac, Mich., returned to work last Wednesday, the differences having been adjusted to the satisfaction of both sides.

Hudson Increases Floor Space—Work is being rushed on the new addition to the Hudson Motor Car Co.'s plant, in an effort to have it ready for occupancy by December 15. The new building is 530 feet long, 60 feet wide and two stories high. It will increase the floor space to 236,411 square feet.

Mora Plant to be Sold—A peremptory sale of the entire Mora plant, including 60 cars, machinery and buildings, will be sold to the highest bidder Nov. 14 and 15 at Newark, N. Y. Bidders will be offered an opportunity of purchasing single cars. Arrangements will be made with the purchasers of the patterns to supply the owners of the Mora cars with any part desired. The machinery of the Mora plant has been assembled during the past 3 years and is therefore of modern type.

New Car to Be Built at Flint—The Little Motor Car Co. has been organized at Flint, Mich., with a capitalization of \$1,200,000. The incorporators are W. H. Little, of Detroit, formerly factory manager of the Buick Motor Car Co., of this city; C. M. Bogle and W. S. Ballenger, president and secretary-treasurer, respectively, of the Flint Wagon Works Co., whose plant becomes the property of the new firm through the deal just closed. W. C. Durant, formerly general manager of the Buick Motor Co. and the moving spirit in the organization of the General Motors Co., is interested in the new enterprise.

Builds Tire Plant—The manufacture of rims for motor wheels is being developed rapidly in Akron, O., by the Firestone Tire and Rubber Co., which is turning over to this business its old factory as rapidly as removal to the new factory can be completed. One year ago the Firestone company began the erection of a new, modern factory, ½ mile from its old one in South Akron, having been compelled to make the change because of the

development of the industry in general. The new factory is built of the best material throughout. President H. S. Firestone, of the Firestone company, explains this on the ground of his belief that the motor car business will continue to grow for many years, and Akron tire factories must be built with an eye to the future. H. S. Firestone, who has studied the crude rubber situation closely, predicts a continuance of the present low prices of crude rubber. This enables Akron tire manufacturers to simplify their estimates in contracting with manufacturers for the coming year's supply, and all of the Akron factories are busier than they have been in other years at this season.

Goodyear Builds Offices—President Frank A. Seiberling, of the Goodyear Tire and Rubber Co., which has been adding new buildings during the last year and is now building a new five-story office building at Akron, O., states that the company will have 1,000,000 feet of floor space when operations for 1912 are begun, and that this will give the Goodyear company the largest tire factory in the world. The Goodyear factory now is closed for 2 weeks for purposes of inventory and occupation of new buildings erected during the year. The power used by this concern is being changed from steam to electric, an electric power plant having recently been installed.

Disposes of Carbureter Patents—W. H. McMaster, manager of the Alfred C. Stewart Machine Works, Los Angeles, disposed of the United States right to manufacture and sell the Stewart Precision carbureter to the Detroit Lubricating Co., of Detroit, which will at once begin operations on a large scale. The European rights had already been disposed of to the Stewart Precision Carbureter Co., Ltd., which was organized in London especially to handle the carbureter. Alfred C. Stewart, the inventor of the carbureter, recently placed on the market the Stewart gas saver, an auxiliary air device, and the Stewart Machine Works will now devote its attention chiefly to the gas saver.

Panhard-Knight Motor in Small Car—Panthard, which up to the present has only produced one model of the Knight sleeve valve motor, has now decided to build a smaller type. It will be a four-cylinder of 80 by 130 mm.—3.1 by 5.1 inches—bore and stroke, rated at 15 horsepower. This model will be in addition to the 12-horsepower, 80 by 120 poppet-valve model produced for the last 2 years. The new Knight model is given an increase of 10 millimetres in the stroke, compared with the poppet valve model of corresponding bore. The new Panhard-Knight will in all probability be presented to the public for the first time at the London show. The Darracq company is also working on a 16-horsepower slide-valve motor, which will also be hurried forward in order to be ready for the Olympia exhibition.

Manufacturers' Communications

DEFENDS INNER LINERS

CHICAGO, Ill.—Editor Motor Age—The experience of A. D. Carpenter, Sauk Center, Minn., with inner liners as detailed in Motor Age October 5, does not prove anything detrimental to the article for the simple reason that he did not even put them on his car. The fact that he could run a pin through the fabric does not prove it would not turn a nail when in a tire and inflated to a sufficient pressure to run the car. Some people are too ready to condemn a thing before giving it a fair test.

While the inner liner or tire protector may not do all that is claimed by the manufacturers, you will often find this to be the case with many devices used on cars from the tire itself to the top of the car. The writer will give his experience with a set of inner liners or tube protector. We will have to admit that at first sight of the article it did not seem that it would do all that was claimed, but I had two old casings that were about ready for the junk pile and I installed the inner casings about April 1, 1911, at which time the outside tread was practically gone. I thought I could add at least 300 or 400 miles to my old tire. I got a little over 2800 miles more with the help of the inner liners. To this I will make affidavit. The old tire and inner liners are now in the possession of one of the sales agents for the tire protector as I was so well pleased with its service that I wrote to them and at their request I turned over to them both the outside casing and the inner liners. The inner liner gave way after it had been exposed to the ground, which naturally weakened it and a blow-out was the result. I use 33 by 4 inch tires and my car weighs 2500 pounds without any passengers.

The other inner liner was removed at the same time and only after it had been discovered that the outer casing had actually worn through to the inner liner, which would not stand the grind of the road very long. I consider that I got at the very least 2000 more mileage with the tire protectors than I would without and I consider the invest-

ment a good one. Even if the inner liner will do half as much as is claimed for it by the manufacturers it is a good thing. A little help in time of need goes a long ways some times to help a fellow out.

Your outer casing may have a pressure resistance strength of only 75 pounds to the square inch, while your car calls for 85 pounds. If the inner liner has a strength of only 15 pounds, while much more is claimed for it, it would help to strengthen the outer casing just that much in an emergency.

If you get stuck in a hole with a car weighing from 3000 to 4000 pounds, a helping lift of only 100 pounds would possibly get you out. Some of the very best make of tires have proven to be worthless. This is true of everything. Some who have used inner liners have not found them satisfactory. This is not my experience and I would not be without them, especially when I am using old casings. The casings that I discarded at last have done over 12,000 miles service on all kinds of roads. This is a good record and possibly the maker of this tire would almost give me a new set of tires for the old casings and my affidavit as to the mileage.

Had Mr. Carpenter given the liners a test his letter might have been of some value to a prospective purchaser of a set of liners. The merit or demerit of an article can only be ascertained by actual service. So long as we cannot get the tire people to make a heavier tire, we must use something to help out. The inner liner and inner shoe are the best I have found and will continue to use them until we get something better.—J. M. Brown, States Mfg. Co.

QUESTIONS OIL-TESTING DEVICE

Worcester, Mass.—Editor Motor Age—Referring to Motor Age, issue October 19, page 27, in which you illustrate, Fig. 4, a simple oil-testing device made of double saucepan for determining the flash point of lubricants, we wish to criticize this device for the reason that, as you will clearly see, motor oil flashing around 400 degrees and above could not be tested in a device of this kind, for the reason that water boils at 212 degrees and before the oil could be brought up in temperature to where it would flash, the water necessarily would have to be all evaporated, consequently of what use is the water?—White & Bagley Co., H. P. Bagley, president.



Plattsburg plant of the Lozier Motor Co., where are made all the castings used in Lozier motor cars. This plant employs 600 men and acts as the foundry for the main works at Detroit. Rear axles, hubs, pumps and many of the units of the car are made here. The combined product of the two plants is 1,000 motor cars annually.



Brief Business Announcements

COLUMBIA, MO.—John N. Taylor has taken on the agency for the Westcott car.

San Antonio, Tex.—The Ohio line will be represented by the C. H. Dean Motor Sales Co., with headquarters located in this city.

Portsmouth, O.—Poole & Ruhlman have taken possession of their new garage on East Gallia street, the building having a capacity of 150 cars.

Pittsburgh, Pa.—The Federal Motor Car Co., representing the Oldsmobile in the Pittsburgh territory, has added the Ohio car, and will represent the latter as distributor in eastern Pennsylvania and West Virginia.

Des Moines, Ia.—N. A. Cruzan, who for a number of years has had a large territory surrounding Des Moines for the Cartercar, is no longer agent for that concern. Mr. Cruzan has retired and the Cartercar Iowa Automobile Co is the name of the new agency.

Boston, Mass.—The agency for the Mitchell line in Boston formerly handled by W. M. Jenkins & Co., has been placed with Lawrence & Stanley, a new firm just organized to handle it. Salesrooms have been secured on Massachusetts avenue, near Boylston street.

Syracuse, N. Y.—The 1912 Buick will be represented in Syracuse by a new motor car concern, the Buick-Keating Co., just formed. P. L. Keating, of Oswego, and J. O. Bradeen, former division superintendent of motor power of the R. W. and O. railway, are the members of the firm.

Richmond, Va.—Hutzler & Co., with a capital stock of from \$5,000 to \$25,000, has been incorporated. The officers are: H. C. Beattie, Sr., president; Jonas Marcuse, vice-president; Leroy Hutzler, secretary and treasurer. The company will handle motor cars and supplies, besides dry goods, groceries, and has privilege of opening branch stores throughout the state.

Indianapolis, Ind.—During the week beginning October 23, the Indianapolis sales branch of the Premier Motor Mfg. Co. is having a show in the Premier sales rooms at 312-324 North Delaware street. The north portion of the sales room has been converted into a desert scene, depicting a part of the recent ocean-to-ocean tour. The remainder of the sales room is given over to a display of the 1912 Premier line.

This is the first show of the season in Indianapolis.

Davenport, Ia.—The Buck Motor Car Co. has been appointed agent of the Velie.

Baltimore, Md.—C. R. Mizner, Baltimore, representative for the Oldsmobile, has opened his new showrooms at 1419 North Charles street.

Montgomery, N. Y.—The Security Reliner Co. will erect a factory here for manufacturing auto tires. Elmer I. Emerson is president of the company.

South Bend, Ind.—The New Center garage, at 409 South Michigan street, has been opened to the public by its proprietors, O. C. Olsen and W. H. Nichols. The new garage company has the agency for the Buick. Accessories will be kept in stock.

Cedar Rapids, Ia.—G. C. Schneider and W. Morgan have formed the Hawkeye Carriage and Auto Co. They have let contracts for a one-story factory building between Fifth and Sixth avenue, and the building is nearly completed. They will manufacture all kinds of wagons and motor trucks.

Boston, Mass.—J. W. Bowman, agent for the Stevens-Duryea in Boston, was erecting a garage and service depot in Cambridge, but the Massachusetts Institute of Technology has purchased several acres of land all about the place to put up its college buildings, and so Mr. Bowman was asked to stop building and sell the property, which he did.

Indianapolis, Ind.—The Indiana Motor Car Co. has been organized and incorporated in Indianapolis with an authorized capitalization of \$10,000 and will establish a local sales room for the New Parry and Pathfinder. Directors are W. C. Teasdale and W. K. Bromley of the Motor Car Manufacturing Co.; G. C. Simons, C. U. Nankival and L. E. Willson.

South Bend, Ind.—The Fisher Mfg. Co. has been reorganized with capital stock of \$100,000, and will locate in Toledo, Ohio. The new company will be known as the Electric Auto-Lite Co., with A. W. Fisher, of South Bend, president; S. L. Kelly, South Bend, vice-president and general manager; C. O. Miniger, Toledo, secretary and treasurer. The capital stock has been fully paid in and the company expects to move to Toledo immediately. The concern manufactures the Fisher electric lighting system for auto-

matically lighting and igniting motor cars and motor boats.

New York—The Ohio car will be handled by the reorganized Zust Motor Co. of New York.

Altoona, Pa.—A newcomer in the field is the Altoona Motor Sales Co., which has contracted for the Ohio line in this territory.

Columbus, O.—The Kaiser Motor Car Co., 39 West Main street, has taken the agency for the Hupmobile for Franklin county for 1912.

Portland, Ore.—F. W. Vogler, president of the Northwest Auto Co., has placed an agency for the Reo in Myrtle Point, Ore. J. C. Walling will handle the car there.

Indianapolis, Ind.—The Fisher-Gibson Co. of Indianapolis has become the Indiana distributor for the Stearns. This company also represents the Overland, Empire, Stoddard-Dayton, Alco and Baker.

Mishawaka, Ind.—Frank Dean, formerly connected with the Thomas company, of Buffalo, N. Y., has been appointed superintendent of the Simplex Motor Car Co., to succeed Joseph Holloway, who has resigned.

Elmira, N. Y.—The La France Motor Car Co. has incorporated as the La France Garage Co. This change of name is due to the fact that there is another firm in New York city incorporated under the name of La France Motor Car Co.

Indianapolis, Ind.—The Central Automobile Co., North Capitol avenue, has taken the agency for the line of electric trucks manufactured by the Walker Vehicle Co., Chicago. The Indianapolis company will distribute the Walker throughout Indiana.

Columbus, O.—The Warren-Southwick Car Co., Cleveland avenue and Grove street, has taken the agency for the Cutting, covering central Ohio. The company has also closed up for the Garford truck and the Geneva delivery wagon, covering Franklin and adjoining counties.

Des Moines, Ia.—The Herring Motor Co., Iowa agent for the Ford, has established an agency at Waterloo. The company will be known as the Repass Automobile Co., and will handle Fords exclusively. The Herring company will handle nothing but Fords in 1912, having relinquished the local Rambler agency.

Portland, Ore.—The Halliwell Co., northwest agent for the Warner instruments and other accessory lines, has recalled J. T. Moulthrop, sent to Portland to take charge of the local branch when H. L. Worthem was transferred from this territory to San Diego, Cal., to open up a branch in that city. The company has



placed W. J. Worthem in charge of the Portland branch.

Columbus, O.—Hardman & Parker, on North High street, have landed the agency for the Reo.

Chicago—The Commercial Car Sales Co., a new concern, is opening at 918 South Michigan avenue, where it will handle the Autocar.

Tacoma, Wash.—For 2 years connected with the factory branch of the Ford Motor Co., at Seattle, W. C. Baldwin has taken charge of the Tacoma agency for Ford cars.

Boston, Mass.—The Boston branch of the Lenox Automobile Co. has been moved from 16 Pleasant street to Columbus avenue, giving it a frontage on the avenue in the motor mart.

Boston, Mass.—The building at 1070 Boylston street is now being remodeled, and when the work is completed the Metz company will move into it from its present salesrooms on Huntington avenue.

Columbus, O.—Plans are being prepared for a factory building, 62 by 85, to be built at Fulton street by John Immel & Sons for the manufacture of electric trucks and for repair and repainting of motor cars.

Boston, Mass.—The Hupp Corporation has opened salesrooms in Boston with headquarters at 563 Boylston street, Copley square district. W. B. Doan, formerly manager of the Olds Motor Works branch in Detroit, is in charge of it.

Indianapolis, Ind.—It is announced that the Whiteside Motor Truck Co. has leased the buildings formerly occupied by the Safety Shredder Co. at Newcastle, and will move to that city. The Whiteside, at present, is manufactured at Franklin, Ind.

Baltimore, Md.—The latest truck to enter the Baltimore field is the Federal, which is being handled by the Oakland Sales Co., representative for the Oakland car, 107 West Mount Royal avenue. The company is the distributor for the truck in Maryland, Virginia and the District of Columbia.

Indianapolis, Ind.—A number of changes have taken place recently in Indianapolis trade circles. Oren Chilson, formerly with a Marion, Ind., company, is now with the sales department of the Conduit Automobile Co.; G. W. Chapman, who traveled for the United States Tire Co., is with the Indianapolis branch of the Fisk Rubber Tire Co.

Philadelphia, Pa.—The United States Motor Tire Co., 846 North Broad street, has purchased the stock and business of the William Sanford Co., occupying the adjoining building. The Sanford company handled the Bosch magneto and Sampson tires in Philadelphia and adjacent territory. After alterations are completed both businesses will be conducted in the enlarged store. T. F. Fealy

is manager of the United States Motor Tire Company.

Syracuse, N. Y.—The Syracuse Regal Auto Co., 1205 West Genesee street, will handle the Regal here.

Wilkes-Barre, Pa.—Williams S. Lee has taken the agency for the Ohio car in Wilkes-Barre and surrounding counties. In addition to the Ohio line Lee will represent the Hudson.

Brooklyn, N. Y.—The Frank Dunham Co. will represent but two cars in the Long Island territory in 1912. He has taken on the Ohio line in place of the Mercer, and will continue to represent the Lozier.

San Francisco, Cal.—The Reo Pacific Co. has been appointed distributors of the Premier cars in northern California and Nevada. For the past year the Reo has been handled here by the Cartercar Auto Co. Norman de Vaux, manager of the Reo Pacific Co., also takes over the Reo wholesale business in southern California, so long handled by Leon T. Shettler. He

Recent Incorporations

Pittsburg, Pa.—R. C. H. Auto Co., capital stock \$5,000; to manufacture, buy, sell and hire motor cars; incorporators, Roy E. Jacques, Kenneth S. Burley, William H. Houck and George G. Hagan.

Grove City, Pa.—Bessemer Motor Truck Co., capital stock \$100,000; to manufacture and deal in motor vehicles; incorporators E. J. Fithian, L. M. Monroe, I. M. Lewis and W. H. Shellito.

Philadelphia, Pa.—Quaker City Supplies Co., capital stock \$5,000; general supplies and buy and sell motor cars; incorporators H. K. Megahan, P. S. Warn and George K. Warn.

Scranton, Pa.—Scranton Penn Auto Co., capital stock \$10,000; general motor car business; incorporators John Von Bergen, Jr., Philip Rinsland and David J. Davis.

Chestertown, Md.—Chestertown Automobile & Garage Co., capital stock \$25,000; incorporators H. B. Simmons, A. P. Rasin and L. B. Russell.

Chicago—Harbeck Motors Co., capital stock \$50,000; to manufacture motors and hardwood specialties; incorporator A. T. Ewing.

Columbus, O.—Automotor Co., capital stock \$50,000; to manufacture trucks; president, F. W. Dickinson.

Vinita, Okla.—Vinita Automobile Co., capital stock \$10,000; incorporators W. A. Cronon, M. R. Kapp and Mrs. M. R. Kapp.

Camden, N. J.—International Airless Tire Co., capital stock \$100,000; to manufacture tires; incorporators J. H. Nixon, I. Zimmerman and T. B. Hall.

Binghamton, N. Y.—Michigan Auto Joint Co., capital stock \$10,000; to manufacture and sell universal joints; incorporators, C. E. Perkins, John F. Carter and F. L. Perkins.

Philadelphia, Pa.—Cavac Motor Car Co., capital stock \$500,000.

Boston, Mass.—Amplex Motor Car Co. of New England, capital stock \$25,000; general motor car business; I. B. Spafford, president and treasurer.

Boston, Mass.—National Sales Co., capital stock \$25,000; to manufacture gasoline purifiers; J. A. Farrer, president; W. G. Nixon, treasurer.

Dayton, O.—Dayton & Troy Automobile Co., capital stock \$10,000; incorporator, E. C. Emerick.

will establish a branch of the Reo Pacific Co. in the southern metropolis.

Wheeling, W. Va.—The West Virginia garage at Eoff and Sixteenth streets, has taken the White agency.

Columbus, O.—The Perry Auto Top Co. has opened a plant for the manufacture of tops and other accessories at Naghten and Lazell streets.

Davenport, Ia.—The Davenport Auto Co., recently incorporated, with Charles Frey manager, will shortly be ready for business, the successor of the Campbell Motor Car Co.

Circleville, O.—Gus Schiear, formerly connected with the Charles Schiear Motor Car Co., has taken the agency for the Hupmobile in Circleville and surrounding country.

Des Moines, Ia.—Frank Gotch was in Des Moines last week and closed contracts for territory with the Studebaker Corporation, to handle E.-M.-F. and Flanders cars. Gotch also is agent in Humboldt for the Mitchell.

Columbus, O.—S. W. Schott, of Westerville, Ohio, has taken the 1912 agency for the Brush for Columbus and central Ohio. The principal salesroom is located in Westerville, with a branch at Fourth and Chestnut streets, Columbus.

Columbus, O.—The John W. Brown Mfg. Co., which operates a plant on West Town street, for the manufacture of lamps of all kinds, is compelled to increase the capacity of the plant. A large addition is being erected and additional equipment will be installed.

Indianapolis, Ind.—The State Automobile Co., state distributors for the Marion and Krit, formerly at 328-30 North Delaware street, announces the opening of its new salesroom at 235 North Pennsylvania street, which formerly was occupied by the Gibson Auto Co.

Toronto, Can.—With the formation of the American Motor Sales Co. of this city comes the announcement that the Ohio line will be handled by this company in Canada. Already plans are under way for the erection of an Ohio service station in Toronto, in connection with the Canadian dealers who will have their showroom in the same building.

Mishawaka, Ind.—The Central garage has been opened at Mishawaka. The building in which the new concern is located has been remodeled and refinished, a cement floor has been laid, and the structure fitted up to answer the purpose. The floor space measures 60 by 50 feet. The second floor will be utilized for machine work and repairing. P. M. Shea is the proprietor of the new garage.





The Motor Car Repair Shop

INASMUCH as new motor car garages are almost continually being erected and old ones improved almost daily in different parts of the country, the machine tool equipment of the repair shop is ever an interesting subject. In equipping the repair department with machine tools, much can be gained by a study of the equipment provided and used in the larger established garages throughout the country. In Fig. 1 is shown the machine tool department of the Packard repair shop in Chicago. This department is fenced off from the rest of the shop with a wooden fence about 4 feet in height, and contains eight pieces of machinery. On the left side is a universal grinder which is found extremely useful in sharpening tools, reseating valves and in making or repairing sundry small parts requiring frequent attention in motor cars. At B there is a milling machine whose services are practically indispensable in many operations. Just behind the milling machine and in front of the large pillar in an out-of-the-way-but-still-accessible position is arranged the arbor press C. This, too, is an indispensable article of the equipment. Behind the pillar at D is shown a fairly large drill press, and behind it at E a power hack saw. Bringing up at the rear along the wall is a work bench with vices at either end of it. On the right and in the rear there are two lathes—a small one and a large one—arranged back to back to economize space and as near the windows as possible to allow one man to work at the one nearest the window. In working at this last lathe the workman stands in his own light to a certain extent, but not to any seriously inconvenient degree. Toward the front from

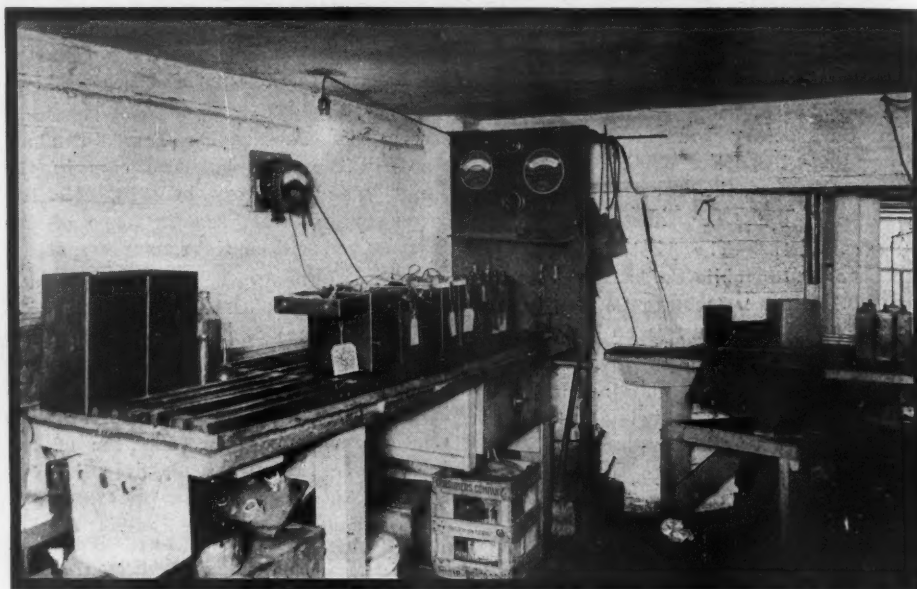


FIG. 2—A SPECIALLY EQUIPPED GARAGE ELECTRICIAN'S ROOM

the lathes is shown a heavy cast iron motor stand F, which is so arranged that when the motor is placed upon it a belt from the shafting above can be attached to the fly-wheel for the purpose of running it in after the bearings have been taken up. The emery grinder and buffing wheel G occupies an excellent position in that the emery dust thrown from it is not liable to damage the machinery.

The Garage Electrician's Room

In almost all up-to-date garages or motor car agencies nowadays some little nook or corner or extra room is provided for the charging outfit and paraphernalia used by the motor car electrician in effecting repairs and adjustments on the electrical

equipment of a motor car. In Fig. 2 is shown a corner of the electrical room provided in the Packard agency, Chicago. This room contains a special charging board comprising a volt meter, ammeter, rheostat and switch, all of which are conveniently arranged at the end of a substantial and suitable charging table. Under this table is stored various large articles of the electrician's equipment, and jars and bottles containing prepared acid or electrolyte, and distilled water. At the right in front of the window is the work bench of the garage electrician, and at the left end of this bench there is arranged a powerful electro-magnet employed for charging or magnetizing magnets.

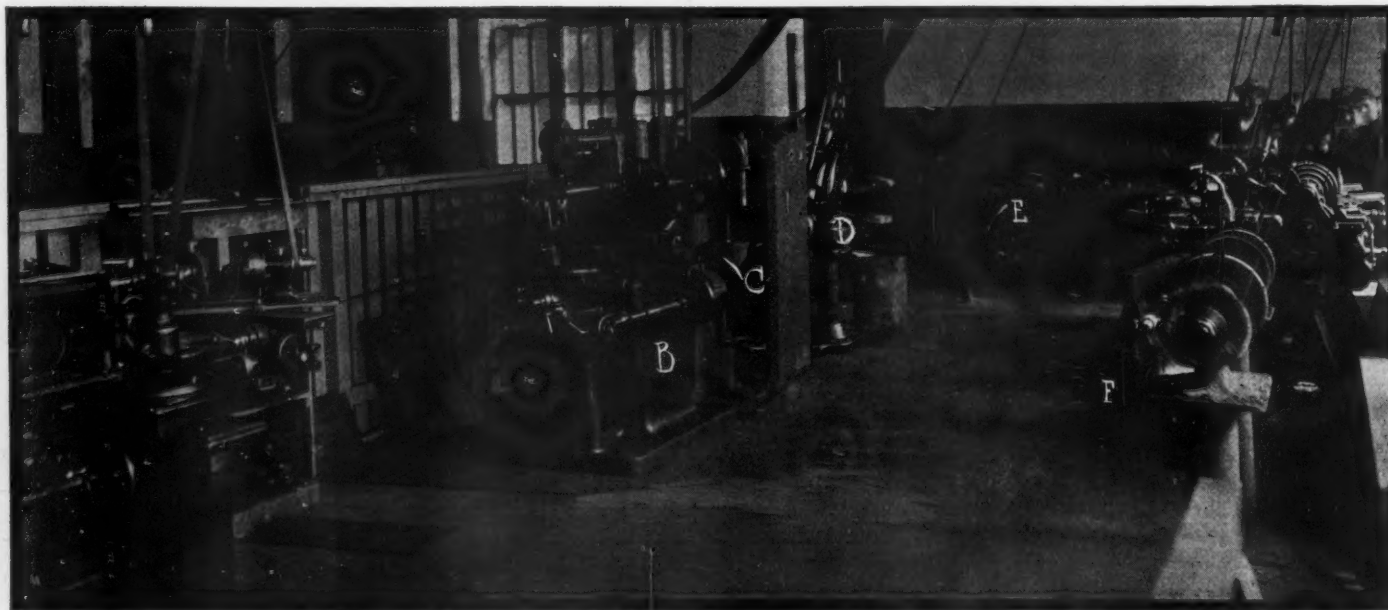


FIG. 1—SHOWING MACHINE TOOL EQUIPMENT AND ARRANGEMENT OF AN UP-TO-DATE MOTOR CAR AGENCY'S REPAIRSHOP